

Western Industry

January
1959

Vol. XXIV No. 1

1959 Cost Reduction IDEA-BOOK

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PRODUCTION EQUIPMENT . . . p. 33

MAINTENANCE SERVICES . . . p. 47

POWER EQUIPMENT p. 61

PLUS: WESTERN OUTLOOK — special WI report of 1959 expectations to help plan
production and inventories p. 9

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JANUARY, 1959

Vol. XXIV, No. 1

1959 COST REDUCTION IDEA BOOK

Selected case histories—in 4 sections—that show you how to save time and money under Western plant operating conditions

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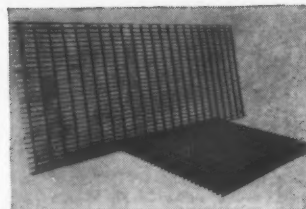
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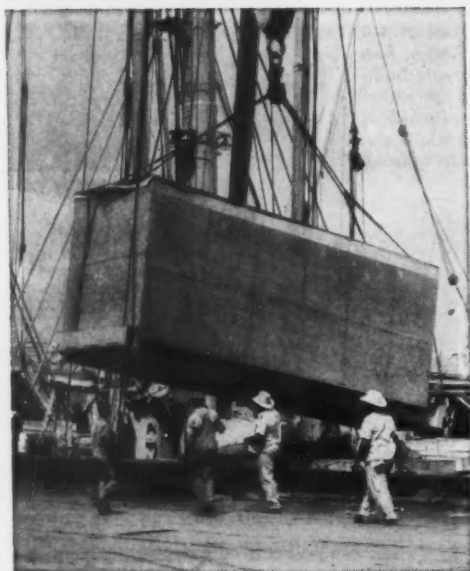
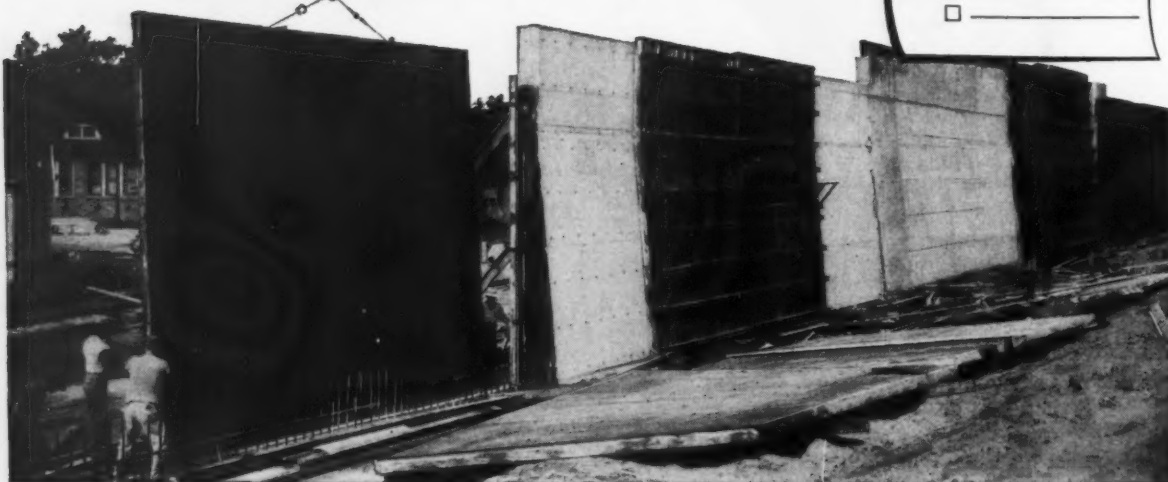
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WESTERN INDUSTRY — January 1959

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WESTERN INDUSTRY — January 1959

Western Outlook-1959

The West's dynamic economy continues to move forward, with moderate gains all along the line expected this year. . .

By ARTHUR C. PRENDERGAST, Consulting Editor

THE WEST IS ON ITS WAY AGAIN. The urge to come West and find a better life keeps its economy dynamic.

Despite the slump of the last half of 1957, announcements of Western industrial plant expansions in 1958 were the second highest on record, topped only by the billion dollar year of 1956.

In most industries plants will be operating at higher volume in 1959 than last year, and if the general upswing of last fall continues at the same rate, the losses of 1957 may be erased and new levels touched. Manufacturing employment in the West reached an estimated average for 1958 of 1,740,000. This is down 74,500 from 1957's peak.

A high level of industrial production is required to serve an area which has an inflow of from 300,000 to 400,000 persons a year, and is credited by the Census Bureau with a population of 25,373,000 as of July, 1958. The West's population rose 5,812,000 in eight years; in the next decade it will gain probably 7,000,000 more. Translated into steel consumption, this means nearly 3,000,000 more tons a year used by 1960.

Changes in individual industries do not affect the general picture greatly. The aircraft cutback of 1957 was largely responsible for reducing California's immigration from 385,000 a year to 320,000, and the coming changeover from military aircraft to missiles may further reduce total employment in this field. But other industries can be relied on to offset this, and the best forecasters predict Cali-

fornia's immigration will stay above 300,000 a year.

Higher costs are ahead for industry in the West. The agreement last fall between the trucking operators and the teamsters' union for a uniform wage contract covering the entire eleven Western states, eliminating historic differentials between the large cities and the outlying areas, will have repercussions for the next

two or three years. Not only do wages go up, but also the cost of delivered materials and finished products.

Office workers are due to get theirs also, for eight or ten major unions are out to organize the white collar people in their industries all the way from Seattle to Los Angeles. The pressure is likely to accelerate in 1959.

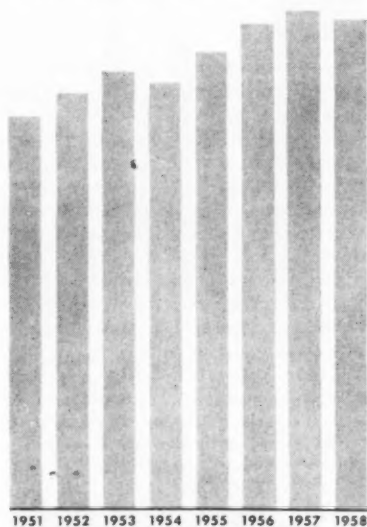
And labor is on the march legislationwise, encouraged by the November election. Industry is just waking up to the fact that it must build stronger defense, but its only immediate accomplishments seem to be new laws in Washington and California requiring registration of pension and welfare funds—an outcome of the labor union scandals revealed by Congress.

But overall, the general outlook for 1959 is sound and healthy, with moderate growth.

Construction

Slightly higher levels, perhaps 5% to 10%, are likely to prevail in 1959. Residential construction for 10 months of 1958 was above the yearly total for the two preceding years, non-residential for 10 months slightly above the equivalent 1957 period, while heavy engineering fell somewhat below earlier years.

Residential building permits for 1959 for the West are estimated at 278,000 units (apartments counted by number of dwelling units in each), compared with about 267,000 for 1958. Bureau of Labor Statistics figures show 232,376 for 1957, 243,607 for 1956, and



Manufacturing Employment

(in thousands)

Source: Bureau of Labor Statistics

	Total	Pacific	Mountain
1958*	1,740.5	1,598.6	226.6
1957	1,825.0	1,555.5	222.5
1956	1,778.0	1,466.7	207.7
1955	1,674.4	1,374.2	192.5
1954	1,566.7	1,400.1	197.7
1953	1,597.8	1,331.7	193.1
1952	1,524.8	1,232.0	185.4
1951	1,417.4		

*Estimated

297,885 for 1955. The sharp rise of last year was accompanied by surplus of unsold homes in some areas and overbuilding of multiple unit dwellings, particularly of the garden apartment type.

Construction Valuation

(figures from F. W. Dodge Corporation in thousands of dollars)

Residential, 11 Western states	
1958 (10 mos.)	\$2,966,018
1957 (12 mos.)	2,756,043
1956 (12 mos.)	2,820,437
Non-residential	
1958 (10 mos.)	\$1,909,085
1957 (12 mos.)	2,103,853
1956 (12 mos.)	2,202,119

Heavy Engineering

	1958 (10 months)	1957 (10 months)
Streets and highways	\$ 642,673	\$ 502,478
Other public works	352,227	470,287
Airports, inc. bldgs.	122,207	82,087
Total (inc. utilities, etc., figs. omitted)	\$1,488,255	\$2,051,856
1956 12 mos.:	\$1,961,930	

Aircraft and Missiles

Total backlog for the West is even with a year ago, and military aircraft production will continue at the same rate for first six months of this year. Commercial production is rising, is now about one-third size of military. Employment has been increasing, but still is slightly down from a year ago.

Missile expenditures are not increasing very fast, and heavy production stage has not yet arrived. Establishment of the Pacific Missile Range for crew training with facilities complimentary to Cape Canaveral, for crew training, entails construction.

Missiles are breaking down the historic airframe-subcontractor relationship, with so many non-aircraft companies now in the prime contracting field. West Coast subs, who lost about 40% of their business in the cutback of 1957, have regained about one-fourth of their loss. The day of the general machine shop with only machine hours to sell is admittedly over.

Research and development expenditures are due to increase and will account for a large quantity of the contracts, and these will severely affect earnings as the fees are low. Lengthy production runs have ceased.



(Top three bars: Total West Coast backlog)
(White bars, top to bottom: Military Aircraft, Commercial, Missiles)

The Aircraft Picture

West Coast	
Plant Area (sq. ft.)	65,800,000
Payroll (annual)	\$44,500,000
Employment	355,000
Backlog	\$7,200,000,000
Aircraft and related	2,800,000,000
Missiles	1,800,000,000
Commercial	2,500,000,000
Los Angeles	
Employment	186,000
Payroll	\$23,200,000
Plant area	35,370,000
Backlog	\$3,500,000,000
Aircraft and related	1,700,000,000
Missiles	642,000,000
Commercial	1,180,000,000

Steel

Consumption in the West is expected to be about 10% higher this year than last, but under 1957.

Bridges, highways, military establishments are due to require more steel, housing upsurge benefits makers of appliances and contractor's products, fabricated pipe demand fairly strong, also ordnance and most machinery. Little improvement expected for pressure and storage tanks, already down 40% from 1957.

Coast and Utah mills produced 4,136,831 tons in 11 months last year, against annual capacity of 6,098,000 tons. Seven Western states' market consumed 6,797,000 tons in 1957, according to Kaiser reports. For 1970 Columbia-Geneva forecasts growth of more than 3,000,000 tons from now, or 44%. This would be double the rate of increase of the national market, and would represent 6% for aircraft, missiles, automotive, shipbuilding, railroad and ordnance, 63% for machinery and appliances, 39% for containers, agriculture, mining, lumbering, oil and gas drilling; 53% for construction. By products groups,

tubular 26%, sheets 60%, plates, shapes and bars 45%.

Aluminum

Estimated 1958 output from Pacific Northwest plants is 471,000 tons, down about 20% from 1957, with prospects slightly higher for 1959 although they will not likely operate at capacity. Capacity, already excessive, was increased 54,000 tons last year by the completion of the Harvey Aluminum Co. plant at The Dalles.

Aluminum mill shapes and castings consumed by metalworking industries in the West in 1957 totaled 40,000 tons—5,895 in castings and powder, 21,499 in sheet, plate, foil and welding strip, 3,961 in rolled bar wire and structural shapes, 8,054 in extruded bar, rod, shapes and tubing.

Residential siding, a 70,000,000 to 80,000,000 pound market is the biggest hope of the industry, as the siding duplicates wood in appearance, needs painting only once in 10 years and is competitive in price. Competitive shingles also are promising.

Foundries

Transfer of the bulk of the oil well tool business from the West Coast to the mid-continent area has been a hard blow for the Coast's gray iron foundries. They suffer also from a lag in agricultural implements, plus slower progress than expected in highway programs, which is reflected in fewer construction equipment orders.

The upturn in shipbuilding has not benefitted West Coast foundries particularly, because most of the castings needed for Maritime Commission and Navy jobs are sent out from the East, being duplicates of those for East Coast ships.

Output of gray iron castings for the West in 1957 was 771,548 tons, divided 458,657 for the Coast, 312,891 for the Mountain area. Steel castings totaled 149,724 tons, 102,443 from the Coast, 47,281 from the Mountain states.

Freight Traffic

Railroad carloadings for the first quarter of 1959 are estimated by regional shippers advisory boards as up 12.3% for the Pacific Coast territory and 3.5% for Pacific Northwest territory over same period of last year.

Lumber

An increase of 15% in the redwood region, 6% in the Douglas fir mills and 3% to 5% in the Western pine area is looked for in 1959.

Output of all varieties last year was the same as 1957, or 8 billion board feet each for the first two, and 500 million for redwood. Good weather until the Christmas holidays carried logging far beyond the normal shut-down time. Redwood mills were the busiest in October since the spring of 1957.

Four new pine mills started up last year, and two dropped out. Many small fir mills are down, waiting out the market.

Many well-established outfits are updating their mills with the addition of kilns, new high-speed equipment, better handling machinery, electronic devices to cut cost and closed-circuit television. Some larger sawmills have built adjacent plywood peeler plants to get better utilization and realization from all their logs.

Sheathing panels of tough kraft paper glued to both sides of lower grades of sheathing lumber are making a hit, and more mills will make these panels this year.

Expansion of the particle board and hard board is expected, with several plants under construction or contemplated, to use left-over wood at sawmills and plywood plants. Packaged and pre-dipped lumber is making some headway against retailer resistance.

Plywood

Douglas Fir Plywood Association estimates 1958 West Coast plywood production at 6.2 billion square feet, a 14% increase over 1957, with an expected 10% to 12% increase this year, or total sales of 6.8 billion square feet.

No mills are down and production capacity increased from 6.3 billion feet to 7.2 billion feet last year. It is expected to reach 7.8 billion feet by the end of 1959.

The most significant development of the year was PlyClips, an extruded aluminum device for joining two panels of roof sheathing, eliminating the wood blocking normally used at the panel edges. Nearly 4½ million were sold, despite the fact promotion was not launched until late spring.

Fabricated construction components, such as wall sections, stressed-skin panels, box beams or trusses are forging ahead, due

to high labor costs, waste and pilferage on the job site.

Agricultural sales are substantially increasing and promise a vast future market.

Electronics

The West already accounts for 23.2% of the nation's sales, an estimated \$13.8 billion in 1958, 18.7% of the employment and 17.5% of the number of firms. Faster expansion than the rest of the country is looked for, due to the growth of Western missile and space exploration manufacturing and test installations and the attraction which Western areas have for the technical personnel essential to the industry.

More of the constantly enlarging defense dollar is going into electronic guidance, detection and control systems. While 65% of the electronics output is for military use, many companies are developing commercial applications for these products and systems.

Annual sales of the electronics industry in the West, exclusive of broadcast and service revenue are reported by the West Coast Electronics Manufacturers Association as \$1,852,000,000. A geo-

graphical break-down for the West is as follows:

Metropolitan Area	Number Electronic Firms	Square Feet Plant Facilities (thousands)	Employment (thousands)
San Diego	28	300	3.5
Phoenix-Tucson	15	230	4.8
Portland-Seattle (Does not include Boeing Airplane Co.)	30	563	4.5
Los Angeles-Orange	450	13,600	82.0
San Francisco-Oakland Peninsula	129	6,356	27.0
Denver and other areas Colorado	14	144	1.6
Balance			
11 Western States	35	380	7.6
Total			
11 Western States	701	21,573	131.0
Total U.S.A.	4000	n.a.	700.0

Metropolitan Areas	Sales (in thousands of dollars)	Payroll (in thousands of dollars)
San Diego	45,000	21,000
Phoenix-Tucson	52,000	22,500
Portland-Seattle (does not include Boeing)	50,000	22,500
Los Angeles-Orange	1,125,000	441,000
San Francisco-Oakland peninsula	380,000	145,000
Denver and other areas Colorado	22,000	7,520
Balance 11 Western states	178,000	35,720
Total 11 Western states	1,852,000(1)	695,240
Total U.S.A.	8,000,000(2)	n.a.

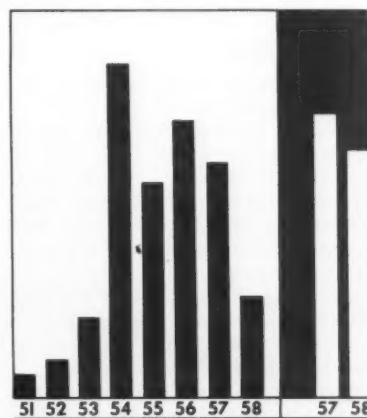
Gas

Additional supply for Southern California is assured through paralleling the pipeline from New Mexico and Texas with an additional line to carry 300 million cubic feet. This is under construction, but a proposal by El Paso Natural Gas Co. to bring gas into Southern California from the Big Piney field in Wyoming via Las Vegas has not yet been approved by the FPC.

Meanwhile Pacific Gas & Electric Co. is marking time on its proposed line from Canada to northern California while the Canadian government makes up its mind about taxation.

Northwest Natural Gas Co. (new name for Portland Gas & Coke) is planning a line to serve Eugene. Washington Water Power Co. of Spokane has big plans for the system it bought from Cascade, and Intermountain Gas Co. of Boise continues to expand. Even Alaska may get natural gas, as it is believed the Nova field in Alberta may be found to extend to southeast Alaska.

Gas air conditioners, an offset to the electric industry's heat pump, are going big in Southern California and there has been an upsurge in that area and Arizona of gas lights for home ornamentation.



Electronics Plant Investment		
in millions of dollars. Source: West Coast Electronics Manufacturers Association		
Los Angeles County		
(represented in chart by bars 51-58)		
Number of new plants (new and expansions)	Investment	
1951	5	\$ 4.3
1952	4	4.6
1953	7	26.5
1954	5	51.4
1955	20	33.2
1956	24	39.0
1957	14	30.6
1958 (6 mos.)	9	11.9
San Francisco-Oakland peninsula		
(bars at right of chart)		
Thousands of square feet plant facilities	Total investment	
1956 (not available)	\$ 89.0	
1957 1,685	121.0	
1958 (6 mos.) 1,171	149.0	

Oil

Although total demand for petroleum and its products increased slightly in 1958 with 1959 modestly upward, due mainly to gasoline and jet fuel, West Coast refineries face a mounting surplus of heavy fuel oil—some 17 million barrels.

The causes are competition of natural gas (aggravated by smog control authorities in Los Angeles ordering industrial use of gas in smoggy weather), decrease in military liftings, the temporary industrial lull and the fact that California crude contains a high percentage yield of heavy fuel oil—30% compared to 12% elsewhere in the country. Less than 1,500 wells were drilled in 1958, compared with more than 2,200 in 1957 in California.

Daily demand figures, for 10 months, in thousands of barrels, are as follows, for the West Coast area:

	1958	1957
Crude	8	7
Gasoline	554	531
Jet fuel	58	46
Distillates	173	175
Residual fuels	284	320
LP gas	43	34
Total	1,260	1,247

Electric Energy

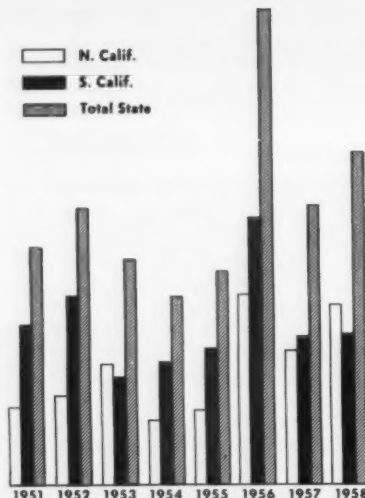
Hydro-electric and steam generating plants under construction keep even with the demand, and the chronic shortages in the Pacific Northwest have disappeared, at least for the time being. Unofficial Federal Power Commission projections are as follows:

Energy (billions of kilowatt-hours)		
	Pacific Northwest (includes Oregon, Washington, Idaho, Montana, Utah)	Pacific Southwest (includes California, Nevada, Arizona)
1960	70.6	72.5
1970	121.1	130.6
1980	181.8	212.4

Peak Demand (millions of kilowatts)		
1960	11.9	12.8
1970	20.2	22.9
1980	30.6	37.3

Chemicals

Although the bottom fell out of the ammonia market last year, one more Western manufacturing plant is under construction and two others contemplated. But fertilizer sales continue to climb, California alone taking more than a million tons. Missile fuels promise to provide a significant market for Western raw materials.



Industrial Plant Expansion

(New plants and enlargements, California only)
(in millions of dollars)

Source: California State Chamber of Commerce

	Total	Northern Calif.	Southern Calif.
1958	\$ 750	407	343
1957	639	300	339
1956	1,040	436	604
1955	479	168	311
1954	420	146	272
1953	511	271	240
1952	627	205	422
1951	539	360	179

Shipbuilding

West Coast shipbuilding no longer languishes, unable to compete with Atlantic and Gulf coast yards. Six freighters are under way to the tune of \$90,000,000, two each at San Francisco, San Pedro and San Diego, under the Maritime Commission replacement program just beginning. Navy contracts for probably \$750,000,000 will be divided about equally between West Coast navy and private yards in 1959.

Offshore oil well drilling rigs costing \$2,000,000 each are due for an upsurge this year. Matson Lines have converted two ships to container cargo, with four more coming up. Seattle yards are busy with ferries and other work.

Pulp and Paper

Western output of pulp and paper products last year was equal to 1957, and 1959 may see an increase of 10%, although plant capacity is far beyond current demand. Paperboard production was slightly above 1¼ million tons, about 104% of 1957, while fibre box output of about 12 million square feet was practically identical with 1957.

Mining

Copper mines and smelters, which had been operating on a four-day week due to lack of demand, went back to a seven-day week recently as the result of a prolonged Rhodesian strike which cleaned out the industry's stockpiles.

With copper now pegged by the government at 39¢ a pound, only about a cent below what producers would like to get, the price is not far from optimum. A 10,000-ton daily output open pit mine nearly as big as those of Inspiration and Miami is being opened by Duval Potash & Sulphur south of Tucson. It does not have a companion smelter.

Uranium mines and mills are operating full tilt, and the AEC's clamp-down on additional capacity has been lifted to the extent of permitting two new mills to be built in Wyoming and New Mexico. Lead and zinc are down in the dumps, while iron ore operations are improving. Of the "glamor" metals, columbium is the most promising right now.

Canning

West Coast canneries, that pack most of the world's supply of canned fruits and a big proportion of the nation's vegetables, got out from under big inventories last year, and have good prospects for 1959.

The major fruit pack, canned peaches, will probably be cleaned out before the 1959 packing season. Tomatoes hit a new high of 13½ million cases, 2 million above the peak of 1956. This may impose a marketing problem, but in general the load should not be excessive. Total California fruit and vegetable pack slightly down from 1957 total of 111 million cases.

Frozen Foods

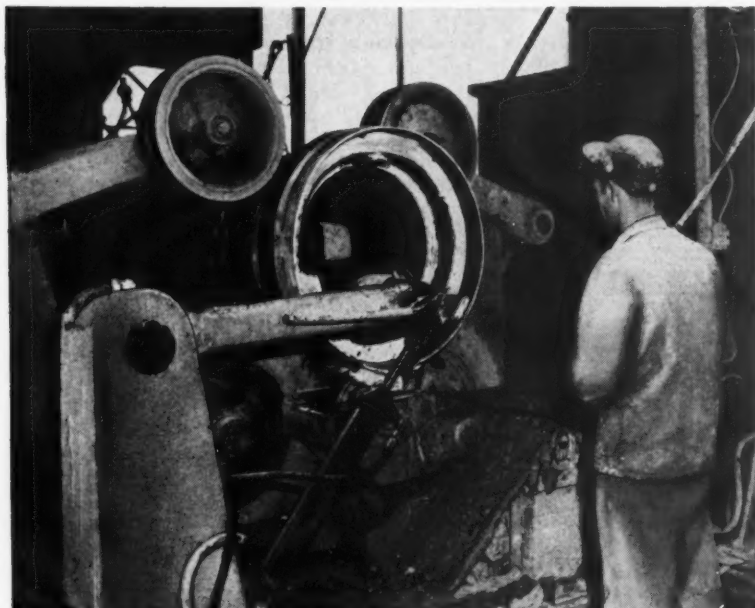
After several years of running away with the strawberry market, California freezers lost their grip in 1958 under a big price break. Hence 1959 acreages and packs will be greatly reduced. Northwest freezers meanwhile regained their 2¢ a pound premium over California on strawberries.

The Northwest pea pack was down on account of hot weather. Popularity of other frozen vegetables continues to grow.

STANDARD ENGINEER'S FIELD REPORT

CHEVRON
PRODUCT OC TURBINE OIL
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FIRM Salt Lake City, Utah

Hydraulic systems rust-free after 2 years



Using Chevron OC Turbine Oil, the 15 hydraulic cylinders controlling this CEN-VI-RO Concrete pipe machine (above) show no sign of rust or pitting after two years' tough service. Utah Concrete Pipe Co. produces high-strength pipe in diameters up to 48" with this centrifugal-vibration-rolling machine—turns out 50, 10-foot lengths daily. Individual lengths weigh up to 8,400 lbs. While mold rotates, hydraulic cylinders using Chevron OC Turbine Oil (formerly Calol) hold mold against driving wheels, force concrete mixture around reinforcing rods, vibrate mold to compact concrete.



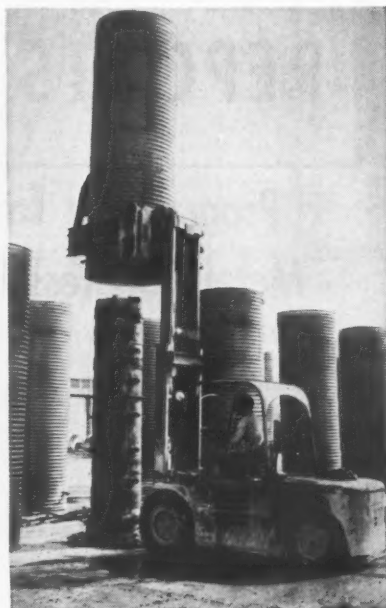
Plant Supervisor Dick Davis, points to one of machine's hydraulically operated eccentric vibrator wheels. "We're well satisfied with the performance of Chevron OC Turbine Oil," reports Mr. Davis. "In both our pipe machines and our fork trucks it's kept hydraulic cylinders working smoothly and reliably in spite of the heavy loads, grit, and moisture in our type of operation."



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WESTERN INDUSTRY—January 1959



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Why Chevron OC Turbine Oil prevents oxidation and corrosion in hydraulic systems



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WESTERN MEETING REPORTS

Program set for Western Metal Congress-Exposition

YOU WILL SEE and HEAR new developments, alloys and fabricating processes for Western industry—including aircraft, rockets, electronics and petroleum production—at the Western Metal Congress-Exposition scheduled for March 16-20 in Los Angeles.

A vast educational display will fill Pan-Pacific Auditorium and specially erected pavilions. The show will be packed with suggestions to expedite top grade production at less cost.

"Progress in Metal Technology" will be the central theme of the sessions set for March 16-20 in the Ambassador Hotel, Los Angeles.

According to **Ted DuMond**, ASM staff coordinator for programs, the first four days will be devoted to technical sessions prepared under direction of **Robert H. Gassner**, local program chairman.

"Selection Criteria—Effects of Service Experience and Changes in Performance Requirements" will be the topic for the first day's technical sessions.

The morning session will be devoted to "Aircraft and Their Power Plants" and "Missiles and Their Power Plants."

Under the first heading will be two speakers. **C. S. Strang**, chief engineer, Tulsa Division, Douglas Aircraft Co., has been invited to talk on "Airframes." **D. K. Hanink**, chief metallurgist, Allison Division, General Motors Corp., Indianapolis, will deliver a paper on "Power Plants."

The "Missiles" section of the program features **L. E. Zwissler**, senior engineer, materials, Aerojet-General Corp., Sacramento, whose topic will be "Solid Propellant Airframes," and **P. Vogt**, assistant chief engineer, Rocketdyne Division, North American Aviation, Inc., Canoga Park, Calif. Vogt's paper will be on "Liquid Propellant Power Plants."

Still under the "Selection Criteria" heading, the March 16 afternoon technical session will be subtitled "Mobile and Stationary Equipment for Processing Industries."

Speakers will be:

G. R. Prescott, research engineer, C. F. Braun and Co., Alhambra, Calif.—Petroleum Industry. **George Nelson**, staff metallurgist, Shell Development, Emeryville, Calif.—Chemical Industry. **C. B. Grable**, chief metallurgist, Bechtel Corp., San Francisco—Power Generation.

Chairman for the morning session will be **George**

Papen, Lockheed, with **Edward Green**, Rocketdyne, as co-chairman. For the afternoon, **Russell Graves**, Fluor Corp., will serve as chairman, and **C. A. Brown**, Ralph M. Parsons Co., will be co-chairman.

All of the second day's morning technical session will be devoted to "Effects of Advances in Mill Practices on Material Characteristics."

First half of the morning session March 17 will have four papers on "Vacuum and Protective Atmosphere Melting."

Speakers and topics will be:

W. W. Dyrkacz, quality control manager, Allegheny Ludlum Steel Corp., Watervliet, N. Y.—"Stainless Steels." **D. E. Nulk**, senior materials engineer, Thompson Products Inc., jet division, Cleveland—"Stainless Steels and Super Alloys." **Frank M. Richmond**, manager, materials research, research and development department, Universal-Cyclops Steel, Bridgeville, Pa.—"Low Alloy Steels." **E. H. Spuhler**, Aluminum Company of America, New Kensington, Pa.—"Lithium-Aluminum Alloys."

Three papers are set for the just-before-noon segment, all based on "Rolling Technology." They are:

"Sandwich Rolling"—**D. C. Buck**, assistant chief metallurgist, United States Steel Corp., Pittsburgh. "Close Tolerance Rolling"—**V. W. Whitmer**, chief metallurgist, Alloy Steels, Republic Steel Corp., Massillon, Ohio. "Taper Rolling"—**Kirby F. Thornton**, assistant chief, sales development division, Aluminum Company of America, New Kensington.

The same day's afternoon program will deal with "Effects of Advances in Intermediate Fabrication Technique on Material Characteristics."

It will open with a panel on "Improvements in Quality Control of Castings," with these panel members:

W. A. Bailey, metallurgical engineer, materials research and process engineering, Douglas Aircraft Co., Santa Monica; **F. R. Drahos**, chief metallurgist, Byron Jackson Division, Borg-Warner Corp., Los Angeles; **Glenn A. Fritzen**, technical director, Haynes-Stellite Co., Division of Union Carbon and Carbide Corp., Kokomo, Ind., and **L. H. McCreery**, Change-Vought representative, Boeing Airplane Co., Seattle.

Two papers to conclude the day's session will be on "Progress in Forging Technology."

J. W. Sweet, chief metallurgist, Boeing, Seattle, will be heard on "Precision Forgings," and **R. Smallman-Tew**, chief metallurgist, AVRO Aircraft, Toronto, on "Compressively Stress-Relieved Forgings."

Chairman for the morning segments will be **Henry A. Curwen**, metallurgical engineer, Earle M. Jorgenson Co., Los Angeles. His co-chairmen respectively will be **W. A. Patterson**, National Supply Co., and **Wilton Ashcombe**, Kaiser Aluminum Co.

In the afternoon, **W. McCue**, Steel Improvement and Forge Co., will serve as chairman, with **John Hall**, Precision Castings, Inc., and **Leonard Hofstetter**, Bromley and Donaldson, as co-chairmen.

For March 18, the program will be based on "Effects of Advances in Fabrication Techniques."

A forum discussion on "Steel Heat Treating—Carbon Control" will start the day, with **Dr. Leo Shapiro**, chief metallurgist, Douglas Aircraft Co., Santa Monica, as moderator.

Other participants in the discussion will be:

Norbert Koebel, director of research, Lindberg Engineering Co., Chicago; **Orville E. Cullen**, chief metallurgist, Surface Combustion Co., Toledo; **W. R. Varney**, superintendent and chief metallurgist,

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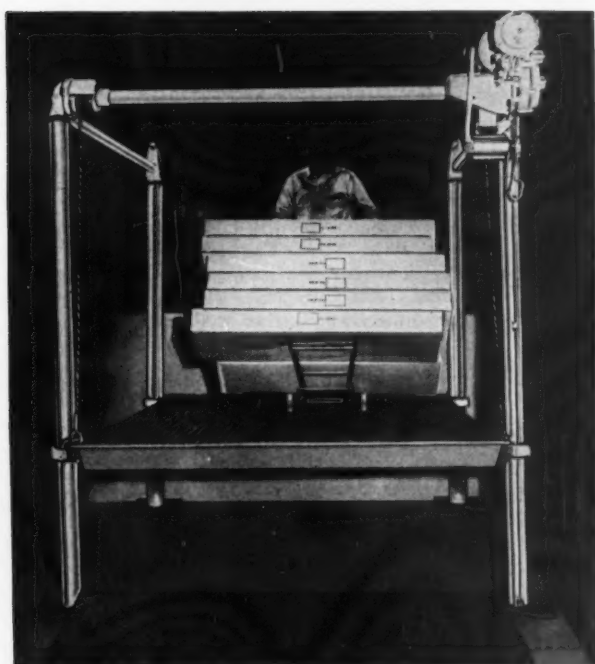
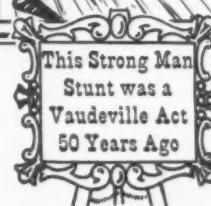
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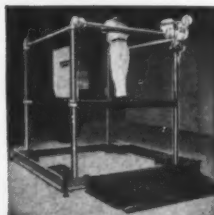
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Calmac Manufacturing Co., Los Angeles.

R. H. Lundquist, vice president, California-Doran Heat Treating Co., Los Angeles; **Morris Tiktinsky**, materials and process development engineer, Lockheed Aircraft Corp., Burbank, Calif., and **J. C. White**, test engineer, North American Aviation, Inc., Los Angeles.

A panel discussion on "Reduction of Warpage" will follow the forum, with these panel members:

J. Soja, senior research engineer, materials and process engineering, North American Aviation, Los Angeles, will talk on "Creek Forming and Die Quenching of Non-Ferrous Alloys."

T. R. Bradley, chief metallurgist, Rohr Aircraft Co., Chula Vista, Calif., will be heard on "Die Quenching of Steel."

H. W. Hill, head, engineering design division, Alcoa Research Laboratories, New Kensington, Pa., will speak on "Thermal Cycling."

In the first half of the afternoon session, discussions will be heard on "Ultra High Strength Steel Thin Wall Pressure Vessels and Missiles."

Dwight F. Gunder, engineering consultant, Loveland, Colo., has been invited to speak on "General Problems Concerning This Subject."

The speaker will be followed by a panel on welding problems, with these participants:

A. J. Williams, research welding engineering, Consolidated Western Steel Division, United States Steel Corp., Los Angeles; **G. B. Pritchett**, chief metallurgist, Solar Aircraft Co., San Diego.

Walter Tenner, head, materials and process, Solid Rocket Plant, Aerojet-General Corp., Sacramento, and **E. P. Owen**, senior engineer, Firestone Tire and Rubber Co., Los Angeles

"Forming" will occupy the last half of the afternoon session, with **S. R. Carpenter**, supervisor of producibility, Convair, Division of General Dynamics Corp., San Diego, and **A. H. Peterson**, group engineer, producibility methods, Lockheed Aircraft Corp., Burbank, discussing "Explosive Forming."

"Hydro Spinning" will be the topic of **L. H. Allison**, superintendent, missile projects, Consolidated Western Steel Division, United States Steel Corp., Los Angeles, to conclude the afternoon's session.

Chairmen for the morning sessions will be **W. C. Anderson**, North American Aviation, and **C. P. King**, Marquardt Aircraft Co. **Fred Spiegel**, Titanium Fabricators, will occupy the chair in the late afternoon.

For the fourth day's program the over-all subject will be "Fabrication and Reliability Problems Associated with Specific Alloys."

The morning's session will open with a forum discussion on "Hydrogen Embrittlement of UHS Steels."

Participants will be **P. W. Kloeris**, metallurgist, materials research and process engineering, Douglas Aircraft Co., Santa Monica, Calif.; **G. G. Wald**, research specialist, Lockheed Aircraft Co., Burbank, Calif.

C. E. Moeller, chief metallurgist, Menasco Manufacturing Co., Burbank; **B. F. Brown**, head, physical metallurgy research branch, metallurgy division, Naval Research Laboratory, Washington, D. C., and **Attwell Adair**, metallurgy research branch, aeronautical research laboratory, Wright Air Development Center, Dayton, Ohio.

WESTERN INDUSTRY—January 1959

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Western Meeting Reports

Three papers as follows will be given after the forum:

"Upgrading Via Specifications"—**Kirby F. Thornton**, sales development division, Aluminum Company of America, New Kensington, Pa. "Magnesium-Thorium Alloys"—**R. Bockrath**, West Coast representative, Dow Chemical Co., Los Angeles. "Titanium and Titanium Alloys"—**W. Stuart Lyman**, consultant, Battelle Memorial Institute, Columbus.

The March 19 afternoon session will have four speakers:

J. F. Baisch, materials units chief, Boeing Airplane Co., Seattle—"17-7PH and AM350 Stainless Steels." **C. C. Angstadt**, metallurgy group leader, materials and process engineering, Douglas Aircraft Co., El Segundo, Calif.—"431 Stainless Steel." **Michael Watter**, director of airframe research, Budd Co., Philadelphia—"301 and AM355 Stainless Steels." **Lawrence J. Hull**, chief metallurgist, Ryan Aeronautical Co., San Diego—"A286 Stainless Steel."

Chairman for the day's morning session will be **C. H. Avery**, Northrop Aircraft Inc., with **N. M. Tilley**, Kaiser Aluminum Co., as co-chairman.

The afternoon's chairman will be **F. Keith Lampson**, Allegheny-Ludlum. Lampson's co-chairman will be **Walter Rhoda**, Armco.

The program committee consists of members of Los Angeles and San Fernando Valley Chapters, ASM.

The committee, which has worked for months in preparing the program, includes:

William C. Anderson, senior engineer, materials and progress, North American Aviation Co., Los Angeles International Airport; **Charles H. Avery**, metallurgist, materials and process engineering, Northrop Aircraft, Inc., Hawthorne.

Franklin R. Drahos, senior metallurgist, pump products, Byron-Jackson Division, Borg-Warner Corp., Los Angeles. **Perry D. Goldberg**, materials and process metallurgist, Douglas Aircraft Co., El Segundo; **F. Keith Lampson**, service engineer, Pacific Coast Area, Allegheny-Ludlum Steel Corp., Los Angeles.

Thomas I. McClintock, assistant chief metallurgist, Aluminum Company of America, Los Angeles; **James A. Perduyn**, metallurgist, staff laboratory, aeronautical and instrument division, Robertshaw-Fulton Controls Co., Anaheim.

W. A. Saylor, chief metallurgist, Consolidated Western Steel Division, United States Steel Corp., Los Angeles; **Joseph L. Waisman**, Western manager, Tatnall Measuring Systems Co., Inglewood.

A two-day panel conference on "Explosive Forming" has been added to the American Society for Metals technical program at the 11th Western Metal Congress in the Ambassador Hotel, Los Angeles.

While the Metal Congress, as well as 11th Western Metal Exposition, will run March 16-20, the "Explosive Forming" panel will take place March 19-20, last two days of the meeting.

Topics to be covered include reasons for use of explosive forming, materials formable, energy sources and transmittal, dies and die materials, applications of principles.

As an honor to **William Park Woodside**, a founder member of ASM, the panels will bear his name. They will be presented by ASM's Metals Engineering Program Committee, of which **Dr. George A. Roberts**, vice president, technology, Vanadium Alloys Steel Co., is chairman, and **Ted DuMond** is secretary.

DuMond says the panels were added because of great interest in this new application by aircraft and missile producers.

A complete working understanding of the process, he said, will be gained by all who attend. There will be no admission charge.

MH problem clinic to tour the West

A MATERIAL HANDLING question-and-answer clinic will be held in May on the West Coast by the Material Handling Institute (MHI).

Sessions are scheduled for May 6 in Los Angeles and May 7 in San Francisco.

The meetings will take the form of luncheons followed by a three-hour clinic session. Sponsoring groups are the Los Angeles and San Francisco chapters of the American Material Handling Society (AMHS), working in conjunction with Society of Packaging and Handling Engineers (SPHE).

All persons interested in material handling techniques and methods are invited to attend the clinic and submit questions. Sessions are free, but a charge will

probably be levied for luncheon. More details later.

WESCON officers elected for '59

NEW WESCON (Western Electronic Show and Convention) officers were installed recently. They are: **H. Myrl Stearns**, president of Varian Associates, Palo Alto, Calif., chairman of the WESCON board, and **Bernard M. Oliver**, vice-president for research and development of Hewlett-Packard Co., Palo Alto, chairman of the WESCON executive committee.

Show director will be **O. H. Brown**, director of marketing for Eitel-McCullough, Inc., San Carlos, Calif.

Convention director will be **Albert J. Morris**, vice-president of Levinthal Electronics Products, Inc., Palo Alto.



LIFT TRUCK DEVELOPMENTS—Howard Palmer (center), general sales manager, Lewis-Shepard Products, Inc., was guest speaker at the December meeting of the Northern Calif. chapter of the AMHS. Mr. Palmer spoke on lift truck developments. At left is **Ray Perin**, Perin Co., Inc., program chairman of the chapter. On the right is **Ellis H. Woolley**, Oakland Naval Supply Center, chapter president.

TECHNICAL COMMITTEE—These members of the SPHE technical committee provided an outstanding program for a recent combined meeting of the Los Angeles AMHS-SPHE membership. Left to right: **Steve Powell**, Douglas Aircraft; **Bill Dickhudt**, Northrop Inc.; **A. E. Flinn**, L.A. AMHS chapter president; **John Moore**, Zellerbach Paper Co.; **Breo Freeman**, Specification Packaging; **Gordon Mustin**, Container Laboratories, and **Jud Bright**, who conducts the annual Lake Placid Conference on Material Handling.



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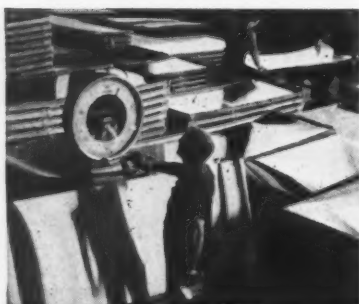
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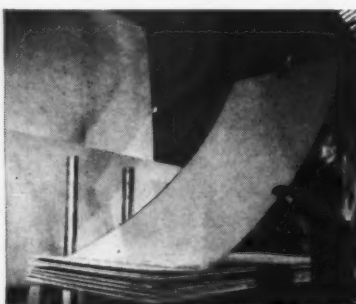
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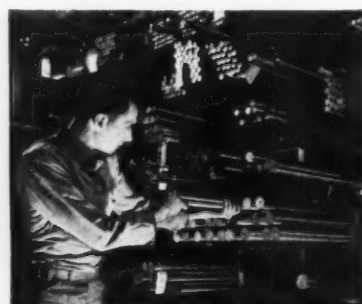
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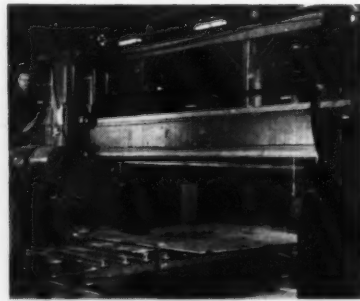
STAINLESS BARS AND ANGLES—Eight types, including rounds, squares, flats, hexagons and angles. Free-machining bars with both analysis and mechanical properties controlled for best performance.



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WESTERN INDUSTRY—January 1959



COST REDUCTION IDEA-BOOK

22 MATERIAL HANDLING

33 PRODUCTION EQUIPMENT

47 MAINTENANCE METHODS

61 POWER & POWER TRANSMISSION

WESTERN PLANT OPERATORS: Get set for a great production year!

But while you're busy figuring ways to make money . . . don't neglect ways to save money and time—which is money.

You know most every operation in your plant can be improved. A new method here . . . a new piece of equipment there . . . and it means money in your pocket.

Because most your operations have aspects particular to the West (sprawling nature of our plants, types of products, problems of distance, climate, outdoor storage and operations, etc.) special techniques are required.

Here are how some Western plants are saving time and money. You'll find some answers in this Cost Reduction Idea-Book.

The following case studies, developed by our field editors, required the gathering of a great deal of manufacturers' literature and technical data—much of which was too detailed to be included here.

Should you want more complete information on any of the installations described, please drop us a note and we'll see that you get it.

MATERIAL HANDLING, PACKAGING & STORAGE

SECTION 1—WESTERN INDUSTRY'S 1959 COST REDUCTION IDEA-BOOK

Paper tube storage pallets cut handling time over 50%

case study 1

PAPER TUBE PALLETS — coupled with a special five-tine fork attachment and load guard — have reduced handling time in half . . . doubled storage capacity . . . and made a safer, more economical operation at A. M. Devincenzi Co., San

Francisco.

The company is a warehouse and drayage firm storing and hauling bakery supplies and general freight. Until recently, the handling system was based on hand labor and the use of hand trucks. Costs were high and storage space was not fully utilized.

To solve these problems, the company switched to unit load handling, using a Hyster Space Saver 40 cushion tire fork lift truck in all phases of the operation. They now handle an average of six carloads of bakery supplies a day — receiving, storing, and

shipping approximately 240 tons of merchandise daily.

One of the keys to accelerated handling and reduced product damage on this operation is the use of paper-tube pallets for handling sacked goods. The tubes are much cheaper than wooden pallets, are more easily stored, and they eliminate snagging of sacks. Both cloth and paper bags are handled, using the 5-tine fork and tube system.

Paper tubes used for pallets are salvaged newsprint cores 30 in. long. Tines are 2 in. in dia., 30 in. long, rounded on the end, and are welded to an adapter plate on 8½-in. centers.

The receiving phase of the operation involves the unloading, on the average, of six railcars of sacked and drummed goods per day. Bagged items (100-lb. size) run about 800 to a car and make up 45 to 53 unitized loads (15 to 18 bags/load). Sacks are hand-loaded on a fixture that is specially built to hold the 5 paper tubes forming the pallet for the load. Stacking in storage is 3 to 4 loads high.

No load spillage has occurred using the paper tube system. The depressions formed in the bags by the tubes prevent the load from slipping or rolling.

The shipping phase of the operation is essentially the reverse of the receiving procedure covered above. Lift truck engages the load in storage by inserting the tines into the paper tubes that serve as pallets and transports it to shipping. The load is then broken down by hand and stacked in delivery trucks.

Prongs on a Hyster Space Saver 40 ease gently but firmly into paper tube pallets which are ideal for handling sacked goods.



Hard at work, this wall type, Link-Belt traveling crane provides uninterrupted service to spray booth, assembly and shipping.

Wall-type, traveling cantilevered cranes solve lift problem

case study 2

WHAT KIND of crane would you select to fill these requirements: adequate lifting capacity to handle fabrications ranging from a 200-lb. screw conveyor to an 18-ton drive assembly for a steel coil conveyor . . . and providing uninterrupted service to a spray booth, assembly section, and shipping dock—all in the same bay.

Link-Belt Co. was faced with these requirements when it moved into its new plant in Montebello, Calif. The answer came in the development and manufacture of wall type, cantilevered, traveling cranes.

The cranes, two in number,

supplement a 20-ton bridge crane. They have a capacity of two tons at 24 ft. Power for travel is supplied by a three-hp. 440-v. motor and a Link-Belt W.B. 40 worm gear drive.

The hoist is also electric powered. Pendant floor operated controls are used for both travel and hoisting. Standard "off the shelf" Link-Belt products such as worm

gear drives, ball and roller bearings, and geared flexible couplings are used throughout the units.

The support frame and cantilever boom are designed to travel on rails along the wall for the full length of the assembly bay just under the bridge crane, giving complete and uninterrupted service to storage, assembly, painting, and shipping areas.

Integrated handling system saves 20 man-hours a day

HOW WOULD YOU LIKE: savings of 20 man-hours a day . . . overtime reduced to less than

case study 3

5% from previous levels that were as high as 50% . . . at least 75 to 80% increase in efficiency and customer service . . . an increase in re-order business?

This is what happened at Theodor of California, Inc., in Los Angeles, manufacturer of women's handbags and purses. But not overnight. The company suffered growing pains when it grew from a one multi-floor building to a three multi-floor building operation.

Because of the rapid expansion, the shipping storage and order assembly operations were badly disorganized. The finished handbags were packed in cartons and stacked wherever room could be found . . . in the halls, offices and manufacturing space.

As many as five order pullers were required to assemble an order. Even company executives were forced to leave their desks at times to help assemble an order. Goods were stocked on several floors and a great deal of delay was caused waiting for the single elevator. Shipments were lagging behind schedule, causing late deliveries—an important factor in a style conscious industry.



On their way up, boxes of handbags are kept in smooth flowing sequence on a Rapistan Power Belt, carrying units to a packer higher up.

But now—with the installation of new equipment manufactured by The Rapids-Standard Co., Inc.—the above time and money savings are in effect.

How does the system work?

1. Boxed handbags on skids are brought by hand truck from manufacturing to the shipping department and storage area.

2. Boxes are loaded into Flow-Rack bays. Each bay is loaded, 3 or 4 boxes high, with a single style and color of handbag.

3. A puller removes handbags from Flow-Rack in filling orders and places the boxes on a Rapid-Wheel conveyor. The first box of each order is identified by a slip.

4. A Rapistan Power Belt raises the boxes over elevator doors which open in the mid-section of the line. The boxes flow on to a wooden turntable where a packer puts them in cardboard packing cases.

5. Packed cases flow on wheel conveyor to a scale where they are weighed for shipment (a length of Rapistan conveyor is on the scale).

6. Cartons are transported on wheel conveyor to a storage point where they remain on the conveyor until picked up by the trucker.

7. Portable aluminum wheel conveyor lengths are used by truckers to assist in loading.



Gear motors in corrugated boxes are checked before shipping. Gaylord Container Corp. boxes replace wood crates.

Corrugated crates assure stability, reduce damage loss

"MONEY IN THE BANK" is the way Western Gear Corp. likes to look upon the savings it's enjoying by shipping gear motors in corrugated boxes.

Wood crates were previously used to ship these gear motors which weigh up to 400 lb. each. Now with corrugated boxes, packaging costs have been cut and shipping costs reduced because of the lower tare weight of corrugated.

Another advantage of the new container is reduction of damage claims. Previously, with the old method, Western usually experienced about 5% damage in shipment. Since the new container has been used (about one year) there have not been any reports of damage.

The new container also has greater "stackability," making possible better utilization of warehouse space. The old containers could be stacked only three to four high because they had a tendency to be rather unsteady. Now, the corrugated boxes can be stacked six high without any damage to the box on the bottom.

Western's customers have expressed approval of this container.

case study 4

They like the ease of handling and appreciate receiving the motors free of dust and dirt that used to accumulate in shipment. Western appreciates the simplified packaging operation and the smooth sides of the corrugated container which can be printed with trademark identification.

The container was designed for Western by Gaylord Container Corp. Division of Crown Zellerbach Corp.

The first step on the packaging line is stitching corner posts into each corner of the box. Next, the container is placed on a wooden skid. After the gear motor is lowered into the box it is fastened to the wood skid with lag screws. A corrugated lid is then placed in position and the package is secured with a single band of steel strapping.

Magnesium loading ramp saves company \$259—\$414 weekly

A LOADING PROBLEM was solved and labor expenses cut by a Western soft drink bottler, when he started using a specially designed loading ramp on the job.

case study 5

The company's bottling operations and warehousing facilities are located in a ground-level plant. Semi-trailers are loaded daily in a large, open yard adjacent to a rail siding. Loading trailers from ground level (there are no dock facilities) required the services of at least three men plus a fork truck.

Two men would remain on the carrier while the third man shuttled a fork truck back and forth between plant and carrier with palletized loads of half-gallon beverage cartons. Loads were hoisted to trailer bed level, transferred to hand trucks and wheeled into the trailer. The operation was slow, the costs were high, and working conditions hazardous for the men.

The company decided to mechanize the loading operation by putting a loading ramp on the job. The results were amazing.

Now, the entire job is handled by one man . . . and the trailers are loaded in less than half the



Gliding easily up a Magliner, Inc. ramp, one man handles loads which used to require at least three men without ramp.

time formerly required. The ramp is wheeled to the waiting trailer, hydraulically raised or lowered to trailer bed height, and securely locked to the carrier.

One man with a fork truck moves the palletized loads directly from the warehouse up the ramp and into the trailer. An average trailer is now loaded in less than an hour's time with no manual case handling.

This new movable ramp, manufactured by Magliner, Inc., has cut the cost of loading each trailer almost in half. During peak shipping periods, the company loads an average of 40 trailers per week; during slower seasons, about 25.

Consequently, the savings realized by having a Magliner magnesium loading ramp on the job ranges from \$259 to \$414 for the company each week.

Folding rubber bag holds bulk liquids in 20-000 lb loads

A NEW CHAPTER in Northwest transportation is being written with the help of a collapsible rubber bag capable of holding 20,000 lb.

case study 6

The bag, made of rubber and rayon cord, is being used in the transportation of bulk liquids by truck.

The new method promises dramatic savings in cost and improvements in service to shippers.

Already "factory" milk, glue, liquid sugar, vinegar and tallow are among the products being

bagged. The possibilities are almost endless.

And, of these commodities, the movement of milk has created the most excitement in this dairy-conscious corner of the U. S. It required teamwork by industry, educational institutions and public health agencies to get this new milk run underway.

Participants in the project include Consolidated Freightways, Inc., which hauls the milk from eastern Oregon farms to the processing plant of Dairy Cooperative Assn., in Portland; the U. S. Rubber Co., which developed the collapsible rubber tanks; Oregon State College at Corvallis, which conducted background research into the plan and is continuing studies to bring about further improvements; the Oregon State



Lying like a giant fish in a flat-bed carrier, collapsible U.S. Rubber Co bag holds 20,000 lbs. of milk on trip to Portland.

Department of Agriculture and the Portland City Public Health Service which are serving as consultants in the research program.

Large collapsible rubber bags for use in transporting and storing industrial liquids were relatively new some 15 or 16 months ago when Consolidated Freightways approached dairy experts with the idea of making these containers work for milk.

The bags, equipped with a sanitary replaceable liner and stainless steel fittings, are 22 ft. long, hold 20,000 lbs. of milk and are carried in refrigerated vans.

The bulk milk is hauled from eastern Oregon to Portland. After unloading, which takes approximately 25 min., the bag may be rolled up into a small compact bundle. The van then is available to haul dry freight on the return run to the milk producing area, eliminating costly "dead-heading" by the trucking firm.

Vulcanized fibre telescoping cases save handling costs

SWITCHING from cumbersome wooden boxes to versatile vulcanized fibre telescoping cases resulted in significant savings in costs, weight and maintenance.

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This is the story of Northwest Orient Airlines which needed containers for shipping delicate electronic equipment. Previously, the company used specially constructed wooden boxes.

But because of the varying sizes of this equipment, new cases had to be constructed for each new instrument. This proved expensive. Custom wooden boxes cost \$35 to \$50 each. Coupled with this was the fact that screws and metal corner stripping often worked loose and damaged passenger luggage.

The airlines solved the above problem with a special heavy-duty Kennett telescoping vulcanized fibre container from National Vulcanized Fibre Co. These containers offered many benefits.

First, the airline didn't have to replace each wooden case, size for size, but needed only three sizes of the Kennett containers to handle the majority of their instruments. Because of their telescoping principle, these Kennett cases were easily expanded or contracted to house a variety of instru-



Ready for the cover to be slipped on, this Kennett vulcanized fibre container can be adjusted to various sizes by telescoping.

ment cases.

Northwest Orient Airlines also found that using vulcanized fibre containers reduced container weight by 50%. In addition to this, the Kennett containers were less than half the cost of the wooden boxes.

The Kennett containers also alleviated the problem of luggage damage. Their smooth, vulcanized fibre surface eliminated scratches and mars. And they are maintenance-free because their solid rivet construction makes them practically indestructible.

Load-Lugger truck hauls 57 full loads over 12-hr period

CLEANING AN EFFLUENT tank on a Sunday is not the most pleasant job. But that's what was required at the Diamond Gardner plant at Red Bluff, Calif.

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To the rescue came a Load-Lugger truck that hauled 57 loads in a 12-hour period—an outstanding achievement for this type of equipment.

But the Load-Lugger is used to such emergencies and full-time duty. At the present time, one Load-Lugger works around the clock, making 27 stops per 24-hr. period . . . and being on call for such emergencies as the effluent tank cleaning.

And it's a big job, keeping 400 acres of plant and ground clean.

The Load-Lugger is suited to this job. A single Load Lugger equipped truck readily services a score of Load Lugger containers of various types. Without containers, a Load Lugger serves as a flat bed truck.

The lugger is a simple hoist mechanism easily installed on a standard truck chassis. Its two rugged lifting arms are powered by two hydraulic cylinders through a pump operated by the power take-off of the truck transmission. Heavy duty lift chains anchored at the outer end of each lifting arm attach to each side of the container.

When actuated by a control in

the truck cab, the arms lift the container on the lugger deck. When dumping, a hook on the Load Lugger bed engages a bar at the base of the container. The hoist arms tilt and dump the container load of material.

Containers are of all-steel, all-welded construction. They are made in 15 standard types, providing a wide selection. Patented design provides maximum safety in handling and dumping.

So you can see why the Load Lugger is one of the hardest working members of the Diamond



A cloud of dust rises from waste being dumped by a Load-Lugger truck capable of hauling 57 loads in a 12-hr work period.

Gardner material handling team—and how it's well-equipped to do more than its share of the work.

Adjustable shelving plays vital part in warehouse growth

FAST, ADJUSTABLE shelving is meeting the expanding warehouse needs for the Los Angeles

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Drug Co., at its recently opened Anaheim, Calif., warehouse . . . and the firm has saved \$28,000 worth of space and erection labor by designing storage around adjustable shelves.

Erectomatic shelving has enabled the drug company to realize the following savings:

One-third fewer shelving racks to do the same storage job . . . a cut of 33 1/3 in floor space required (4,000 sq. ft. at approxi-



Shelving is changed to meet demand at new Los Angeles Drug Co. warehouse. Called Erectomatic Shelving, it's made real savings.

mately \$6.50 per sq. ft. construction costs) . . . more compact, efficient warehousing . . . one-third fewer people to handle the job . . . and a 75% savings on initial erection costs.

Erectomatic shelving permits fully loaded shelves to be moved straight in or out for repositioning in seconds . . . and the entire job of putting in the shelving was done in two weeks, saving 75% in erection costs over bolted shelving.

Erectomatic Shelving is a product of Standard Pressed Steel Co.

Over 280,000 bd. ft. lumber moved daily by 7 straddle trucks

A GIANT HANDLING JOB is being done cheaply and efficiently at the Willamette Valley Lumber Co., Dallas, Ore., where 500 different types of lumber are being moved by seven straddle carriers.

Moving 280,000 bd. ft. of lumber per day, the carriers serve all parts of the plant and yard. Each carrier has 14,000-lb. load-carrying capacity.

The recent expansion of the firm's production facilities to include a huge industrial plywood plant presented the company with a new set of handling problems. A fast efficient handling system was needed to maintain a continuous flow of raw materials, keep a number of processing jobs moving and to expedite shipping operations.

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A fleet of five fork lift trucks with load-carrying capacities ranging from 4,000 to 10,000 lbs., was chosen for the job. Four of the five units are used in manufacturing operations, and the other operates 8 hrs. a day in shipping operations. The lift trucks make an estimated 645 in-plant trips during a 24-hr. period, each trip ranging from 75 to 400 ft.

And current cost of material handling, in terms of per cent of total cost of finished product, is estimated at 3%—far below average for industry.



Hard to handle sheets of plywood are kept moving by integrated use of Towmotor trucks and Gerlinger carriers.

Towmotor trucks and Gerlinger straddle carriers are doing this job and saving the money.

Plastic pump units handle burning acid without injury risk

IT'S HOT! . . . the acid used by North American Aviation, Inc. for chemical etch-milling.

To handle acid involved, plastic sealless pumps are being used to a high degree of success.

Key to this success is a pump design eliminating shaft seals and stuffing boxes. This is accomplished by a tubular liner whose flanges are clamped to the sides of the molded plastic pump housing by end plates.

All fluid pumped is thereby trapped between the outside sur-

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Operator watches carefully while acid is pumped through Vanton plastic pumps in which shaft seals, stuffing boxes, have been eliminated.

face of the liner and the inside of the pump housing. Between these surfaces a squeegee action is created by a rotor mounted on an eccentric shaft which continuously rolls within the liner.

Liner and housing are made in a variety of plastic and synthetic materials, to suit a wide range of corrosive, acid and slurry conditions. Capacities of the pumps, manufactured by Vanton Pump & Equipment Corp., range from 1/2 to 40 gpm.

Semi-auto loader cuts handling time in food packaging plant

A SEMI-AUTOMATIC PALLET LOADER for cartons was installed in California Packing Company's Plant No. 11 in Sacramento, Calif., resulting in greatly increased speeds of handling.

The unit is basically the same as automatic pallet loaders, with the automatic pattern forming portion removed and replaced by manual operation. Pallets are handled through the unit automatically, in the same fashion as the automatic unit, with permissible container sizes as follows:

Height—maximum limited by stability.

Width—18-in. maximum.

Weight—maximum 1000 lb. layer, 3000 lb. pallet.

The full pallet height is equal to 71-in., including pallet.

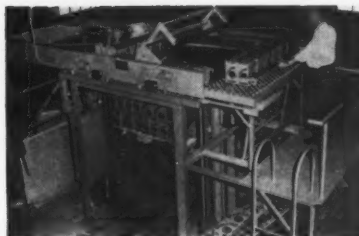
The handling speed of the semi-

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automatic unit is dependent upon the operator's ability to form the pattern. The speeds of the various components of the unit are generally the same as for the automatic unit and, consequently, as far as the machine is concerned, handling speeds should be the same as for an automatic loader . . . in some cases a little faster.

Pallets of the two or four-way type, with bottom boards running either way, can be used under certain conditions. It is possible to mix two or four way pallets, although other sizes would require special attention for the machine.

Pallet sizes permissible are: length—36 to 50 in.; width—36 to 50-in.; height—4-in. minimum to



Being readied for action, semi-automatic pallet loader is checked by operator prior to handling wide range of containers.

6½-in. maximum.

Installed by Mathews Conveyor Co., the units are doing much to make handling more efficient and faster.

Battery run vehicles transport plant personnel in production areas

SPRAWLING WESTERN-PLANTS can sure burn up the shoe leather.

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But why walk when you can ride? Both personnel and equipment do at the vast Lockheed Missile Development Center in Sunnyvale, Calif.

They ride in a small, multi-purpose vehicle that can operate both on and off the streets. These vehicles can travel between crowded buildings, up narrow warehouse aisles, even in corridors.

The fleet of 15 electric cars, manufactured by Laher Spring & Tire Corp., are standard units, except for slight modifications. Both cars are three wheel vehicles running on batteries. Each has identical running gear for simplification of maintenance.

The smaller of the two cars, the Model 6-191, is equipped with a special locking trunk for fast

dispatch of classified papers and blueprints.

One of the larger express models, the Model 100, is used for security police patrol of parking lots and gates. Others provide maintenance crews with fast access to all areas in the Center's operation. The large cargo deck allows the workmen to carry all tools and materials directly to their work, whether inside or out.

Two Express models are especially fitted for fire truck use.

Robert Gambriell of the Center's Plant Engineering Dept. reports that all vehicles are constantly in use, averaging 35 or 40 miles a day. No special maintenance has been required since the cars were installed. Most units are equipped with built-in battery chargers. Whenever the car is stopped for any length of time, the operator simply plugs the car into the nearest outlet.



A fleet of Laher Spring & Tire Corp. cars wait outside the Lockheed Missile Development Center, Sunnyvale, Calif., to transport equipment and personnel.

Refrigerated storage made easy with electrically-run trucks

REFRIGERATED WAREHOUSES PRESENT A HANDLING PROBLEM. Despite

sub-freezing temperatures, efficient handling is vital at the new River Plant of the Terminal Refrigerating Co. of Los Angeles.

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The company found the answer in a fleet of electrically powered material handling trucks.

Now in use are six rider-type fork lift trucks and two low-lift "walkie" trucks. They were specially selected for this operation because of their stand-drive operating position, which allows the operator, who wears extremely



Still steaming with cold, a low-lift Lewis-Shepard walkie truck powered by batteries, emerges from sub-freezing cold storage.

heavy clothes, to operate his truck without being cramped.

The walkie trucks are compact units operated from a control handle while walking along with them. They are used for short hauls, as well as such assorted tasks as loading and unloading outgoing and incoming carriers. The fork lifts, on the other hand, are used to rush goods to and from cold storage rooms and high stack these same items in storage.

The short turning radius of these units manufactured by Lewis-Shepard, their rugged construction and the fact that they don't have grease points, makes them ideal for use in most any general handling situation.

Steel-strapped wood container licks critical rubber storage problem



Operator applies Signode steel strapping to lightweight wooden boxes used in rubber storage and shipping. With Flotainer, film-wrapped bales can be placed on returnable pallet.

COLD FLOW can ruin packaged synthetic rubber. It can cause bale deformation and film rupture during the critical storage and shipping periods.

case study 15

But Shell Chemical Co. has licked this problem with the Flotainer package — a strong, lightweight, steel-strapped wooden container, reinforced at strategic points to withstand the heavy pressure of settling bales.

With the Flotainer, 42 film-wrapped bales—one-half tons of Shell synthetic rubber — can be placed on a returnable pallet.

And you can stack three-high, putting 20 tons of rubber on less than 100 sq. ft.

Steel strapping is an important part in the Flotainer package. Three bands of strapping go horizontally around the package to hold it snug. The Signode steel strapping is applied by Signode's new PSF-4 power strap feeder.

Specially designed castered trucks help cut M-H man-hours 65%

IN MOVING CERAMIC parts around, you can't make like a bull in a china shop. Sometimes it takes a battery of kid-gloved experts to get the parts moved.

case study 16

But at the Sascha Brastoff plant in West Los Angeles man-hours in moving parts between stations have been reduced as much as 65% and safety is assured.

The secret? Specially designed and constructed castered trucks. Each truck is designed to carry up to one-half ton when fully loaded—with eight levels on each



Fully loaded, this eight-level truck can carry one-half ton easily and safely. The secret lies in use of Faultless casters!

side to hold wooden trays. Individual trays can be handled easily and safely.

Faultless 1100 Series casters are used throughout on this type truck. By standardizing on these 1123-4 double ball bearing swivel plate casters, many handling problems were solved immediately.

The four-in. dia. cushion tread Ruberex wheels used on the trucks give the smooth movement necessary to safely move the ceramic items. Four-in. dia. wheels ride over minor obstructions easily, and at the same time provide important floor protection.

And now one man can do the work that formerly required three men! . . . thanks to these Faultless Casters.

Automatic tractor system pays initial outlay in just a year



Automatically feeling its way around aisles, this Guide-O-Matic tractor can operate along wire-loops covering whole production areas.

AN ELECTRONICALLY - OPERATED tractor system which has paid for itself in a year has been installed at Nalley's, Inc., Tacoma, Wash., food processor and distributor.

The operatorless Guide-O-Matic tractor eliminates the need for a driver—meaning that the operator can be used in a more productive capacity . . . and that when the machine works long hours during rush periods at canning time, there are no overtime payments to be made.

The installation includes a tractor operating along a 700-ft. guide wire loop. There are two auto-

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matic stops, one at each end of the tractor train route.

Food products are received at the north end of Nalley's 67,500 sq. ft. warehouse, loaded on trailers, and hauled by the Guide-O-Matic tractor to the transient storage and order picking area at the other end for unloading. Empty trailers are then returned to the loading area.

The Guide-O-Matic system is manufactured by the Barrett-Cravens Co.

Special clamps build rack in minimum space area

THE MOST ECONOMICAL use of every foot of warehouse space was of extreme importance to the Container Service Co. of Los Angeles.

The firm, which manufactures and distributes glass and plastic containers and their closures, wanted a storage setup that would utilize a minimum amount of space and a maximum amount of height.

The answer came from the McDermott & Greene Co., distributor of Beam-Strut racks (manufactured by the Tube-Strut Corp), who pointed out that the new Beam-Strut clamps permit the economic use of standard pipe and channel or I-beam for the construction of double or triple bay heavy duty racks.

So the Container Service Co. installed a rack construction of this type, which has double bay openings of over 12 ft. with maximum

Neat storage lines result from the use of Beam-Strut racks and clamps permitting standard pipe to be used in units.



load capacity in each opening of 8,000 lb. Ordinary 1½-in. pipe for the uprights and cross pieces and standard three-in. I-beam for the stringer or load bearing members were used.

Thus, the most economical use of warehouse space—both horizontal and vertical—was achieved.



Nested firmly in each other, these G. B. Lewis Co. pans, molded from fiberglass reinforced polyester, each have 45 lb. payloads.

Fiberglass tote pans with 45 lb payloads ease stock handling

BOTH RAW AND MOLDED STOCK are being handled in specially designed tote pans at Kirkhill, Inc. of Downey, Calif., largest manufacturer of rubber plumbing goods in the nation.

Molded in one piece from fiberglass reinforced polyester, the pans were chosen because they are lightweight, compact, stackable and nestable. They are easy to handle and their smooth interiors provide dependable protection to the contents. More storage space is immediately made available by use of the pans, which have an average payload of 45 lb. per pan.

Called Stack-n-Nest pans, the units stand out from other industrial pans because of their design. It is possible to both stack and nest them within their own dimensions without the use of any special attachments.

Each end of the pan is molded with a different contour offset, so that when stacked, like ends can be placed together, and the pans nest deeply, without sticking, even when loaded. They resist water, oil, most chemical and temperature extremes and will not dent, warp, rot or soften.

Molded in grey, green and red, they come in sizes ranging from 16x10x5-in. to 39x19x14-in. They are manufactured by G. B. Lewis Co.

Gas, electric truck handles gigantic loads of rolled paper

PAPER IS BEING HANDLED at the rate of 50,000 lb. per hr. at the International Paper Co.'s multi-wall bag plant at San Jose, Calif. . . . and it's being done by a Dynamotive, gas-powered, electric-driven industrial lift truck.

With a lifting capacity of 6,000-lb. the truck handles almost 720 tons of paper each month. Here's how it's used in the production pattern:

Say a run of 4-ply paper bags is scheduled. From the storage area which lies 200 ft. from the production machines, the Dynamotive takes one roll of paper to the printing machine and then another three rolls to the tuber machine.

The bags are then printed, tubed, sewn, and placed on skids automatically. Another Dynamotive, with lighter capacities, handles the loading of these pallets onto freight cars and trucks.

It's a smooth operation and it's paying off in savings. Dynamotive industrial lift trucks are manufactured by the Automatic Transportation Co.

Busy handling 50,000 lbs. of paper per hr., this Dynamotive, gas-powered, electric driven truck is doing giant job.



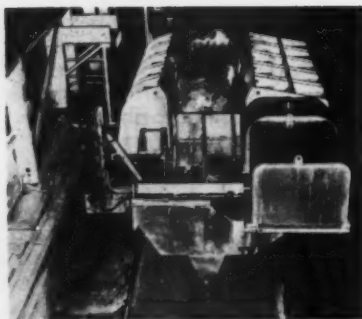
Steel handling eased with ingot buggy run on control system

AN AUTOMATICALLY-POSITIONED ingot buggy has improved ingot handling for the roll mill operations at Geneva Works of the Columbia - Geneva Steel Division, U. S. Steel Corp., Provo, Utah.

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Use of the control system has virtually eliminated down-time resulting from electrical failures of the buggy and, at the same time, has reduced the time required for the ingot buggy's 370-yard round trip from soaking pit to rolling mill.

Columbia-Geneva engineers designed the buggy which is attached to a cable running between two large drums housed at either end of the 185-yard route. As the cable is automatically wound on



Bearing a flaming load of steel ingots, this buggy is constantly under perfect control of attached cable device.

to the drum, the buggy moves in the desired direction. For the return trip the cable is rewound on the opposite drum.

Prior to installation of the magnetic amplifier control system, manufactured by General Electric's Industry Control Dept., the buggy was self-operated and remotely controlled from a pulpit. Now an operator directs transportation of the hot ingots, precisely positioning pit and rolling mill stops of the cable-drawn ingot buggy by the push of a button.

Six lines of tramrail tracks, tubers enable 1 man to handle heavy loads



Almost hidden between paper rolls, one operator handles loads up to 2,000 lbs. with overhead rails and electric hoist.

OVERHEAD MATERIAL HANDLING at the St. Regis Paper Co.'s bag plant in Tacoma, Wash., has been simplified by use of six lines of tramrail track over as many tubers.

case study 22

Paper made on the floor above is handled into the tuber machines by hand-propelled carriers which are provided, one for each track. The carriers have electric hoists and vary in capacity from 500 to 2000 lb.

The tramrail equipment, manufactured by the Cleveland Crane & Engineering Co., enables one man to lift and handle the rolls into the tubers easily and quickly. They are usually 42 in. in diameter, but vary in length from 18 to 62½-in., and weigh from 500 to 2000 lb.

The plant produces bags of 5 to 100-lb. capacity, having from two to six paper walls in each bag construction to add strength.

They are used in a variety of packaging applications.

Warehouse storage range increased 25% with hand lift truck



Carefully watching a capacity 2,500 lb. load gliding easily into its storage space, operator uses handle controls on this Revolver Co. truck.

A 25% INCREASE IN LINES HANDLED in the same warehouse space has been announced by the Handy Spot Co. of Northern California, while increasing efficiency and maintaining full flexibility in order selection—the secret lies

case study 23

in use of a walk-along electric lift truck.

Using single or double deck pallet racks, a walk-along electric truck of the high lift platform type, and a hand lift truck for spotting and to supplement the electric truck, has set up a system which has proved most successful.

The electric truck has a lift of 120 in., a capacity of 2,500 lb., right angle tiers 46 in. long by 30 in. wide, and loads in aisles as narrow as 80 in.

An articulated base with outrigger casters insures stability even when turning the electric truck, manufactured by the Revolver Co., although the load may be in a fully raised position. A telescopic mast permits passage through a 7-ft. door.



QUICK SWITCH TO AIRCO 3 TUBE CUTTER *...and you're in BUSINESS!*

Triangular stack design gives Airco Cutting Attachment rigidity for extra-long service life

Put this new Airco torch on your toughest, most abusive jobs. It stands up better than any previous 3-tube cutter—or any existing 2-tube cutter.

Go from WELDING to CUTTING in seconds! Twist!—Airco welding tip-mixer assembly is OFF. Twist!—new Airco 3-Tube Cutting Attachment is ON! You don't need a wrench.

Gases mixed in tip! That's right — new Airco 3-Tube cutter mixes the gases right in the tip. No premixing. No leakage. No flashback.

Slice 8" steel! Get Airco Model 3800 to cut steel up to 8"—fits Airco 800 welding torch. Get Airco Model 3700 for steel up to 6" on your 750 Airco torch, or up to 4" on your 700 Airco torch. Both 3800 and 3700 take practically all Airco $\frac{3}{4}$ " seat tips.

There's no better time than right now to try your first Airco 3-Tube Cutting Attachment. Phone for a demonstration. For the name of your nearest Authorized Airco Dealer, look in the Yellow Pages of your telephone book under "Welding Equipment and Supplies." Or call your nearest Airco office.



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Air Reduction Pacific Company is a division of Air Reduction Company, Incorporated. Principal products of other divisions include: PURECO — carbon dioxide — gaseous, welding grade CO₂, liquid, solid ("DRY-ICE") • OHIO — medical gases and hospital equipment • NATIONAL CARBIDE — pipeline acetylene and calcium carbide • AIRCO CHEMICAL — vinyl acetate monomer, vinyl stearate, methyl butynol, methyl pentynol, and other acetylenic chemicals • COLTON — polyvinyl-acetates, — alcohols, and other synthetic resins.

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Here's a solid tip on a real blue chip performer in the gummed tape market: *Buy Flash-Tite!* ... You'll never regret it.

Flash-Tite's stock is soaring with everyone from top execs to shipping clerks because its new formula ups production ... lowers costs. Why? New Flash-Tite lies flat, molds easily around corners. It's usable to the last inch. It gives a quicker grab, yet remains sticky longer.

*Paper Products
for all America!*

Don't speculate in gummed tapes. Let us send samples and a gummed tape Investment Counselor. We'd like to prove Flash-Tite will pay you dividends.



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PRODUCTION EQUIPMENT AND TOOL APPLICATION

SECTION 2—WESTERN INDUSTRY'S 1959 COST REDUCTION IDEA-BOOK

Rail on lateral boom adjusts automatic arc welding unit

A NEW ANGLE on automatic arc welding was pointed out by Harry S. Powell, production manager of Pittsburg-Des Moines Steel Co., when he described a new welding device.

case
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Novel feature of this 6,300-lb. manipulator for automatic submerged-arc welding is the mounting of the 33-ft. rail on lateral booms at either side, thus allowing the rail to be moved in or out independently at either end a maximum of 6 ft.

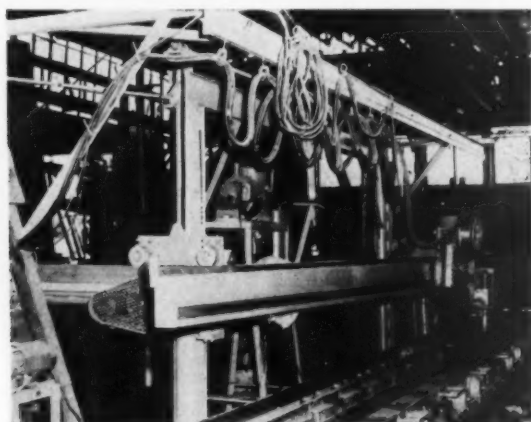
This gives an angular adjustment of as much as $25\frac{1}{2}$ deg. from the parallel position for handling long welds in tapered girders and other shapes requiring off-line welding without repositioning of work. This flexibility is possible through incorporation of hinge plates and pins at the connections between booms and rail, plus a sliding hinge or bushing on one boom.

Columns and booms are of 8-in. pipe, with angle iron track rails

welded to them. The rail is simply two 10-in. channels welded together, with cold rolled flat bars intermittently welded to the top and front faces for the rollers of the welding carriage.

This eliminated all machining on the rail. Vertical travel of the boom is 8 ft. through chain and sprocket drive from shafts mounted along the upper flange of the WF beam joining the tops of the columns.

The latter are spaced on 20-ft. centers, with overall height 11 ft., 6 in. Vertical and lateral movement of the booms is controlled through three pushbuttons on a pendant switch at the operator's position, which also has the control buttons for the standard submerged arc welding carriage and head. Flux recovery unit will be noted at the rear. The unusual manipulator was the subject of an award-winning paper submitted by Mr. Powell in the recent Machine Design Competition sponsored by The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio.



Novel feature on this submerged-arc welding unit is mounting of 33-ft. rail to give maximum angular adjustment.



Traub-automatic chuckers cut machining operation from 20 min. to 1 min., 35 sec. in production of diesel engine parts.

Automatic chuckers drastically cut time in machining job

A MACHINING OPERATION was reduced from 20 min. to 1 min., 35 sec., by using automatic chuckers in the production of diesel engine replacement parts.

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Faced with a multiple machining operation on a cast Meehanite water pump impeller, the A.V.W. Mfg. Co., Los Angeles, purchased an automatic chucker.

On its cast parts (which are received in rough cast form), are chucked on the hub, drilled, faced over a $4\frac{3}{4}$ -in. surface and turned in the first operation. Fins are turned to a 25-deg. angle, faced, and the hub bored to $1\frac{1}{2}$ in., while the drilled hole is bored to $\frac{5}{8}$ in.

Total machining time for both

machining operations: 1 min., 35 secs.

All tolerances are held within limits with only one set-up and every tenth piece is spot checked. Previously this part was machined on a turret lathe, but the handling and gaging of every part necessary to assure acceptable tolerances was unsatisfactory and time consuming.

A.V.G. Mfg. Co. also reports a 300 to 400% increase in cutting tool life after placing the job on the Traub automatic chucks, principally due to the smooth feed of the automatic lathe. Further savings result from A.V.W.'s policy of using only throw-away carbide inserts, eliminating the necessity of removing tool holders to sharpen a cutting edge.

Traub automatic chucks are sold by Alexander Machinery Co. in Los Angeles.

Special tolerance lead brass tube saves production cost

BY SHAVING time, labor and materials, the H. L. Gee Mfg. Co., Beverly Hills, Calif., has lowered costs and increased sales.

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This firm, manufacturer of lawn sprinkling systems, was especially troubled with the excessive amount of time required and scrap produced in the machining of free-



Satisfied looks result from savings in machining costs through use of free-cutting high lead brass tube.

cutting brass rod for the moving piston parts of its sprinkler heads. The company felt that through improvement of this production step, considerable cost saving could be achieved.

Specialists from Chase Brass & Copper Co. were called in to assist in this project. They suggested a

switch to a custom-made, special tolerance, free-cutting high lead brass tube.

Use of this Chase tube in production runs has done all that the sprinkler manufacturer desired. Machining time has been cut by

one-third, and the scrap now produced is 80% less than that when the brass rod was used.

Parts now cost less to produce, and Gee has made another step forward in its cost-cutting campaign.

All types of surfaces bonded with quick sprayable adhesive

A SPRAYABLE ADHESIVE is being used for bonding both porous and non-porous surfaces by

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Architectural Porcelain Contractors, Hollister, Calif., and as a result of this method, the company has developed an automatic operation for bonding all types of sandwich panel materials.

And production rates have been increased up to 120 sq. ft. of adhesive coated panels per minute.

The adhesive has a rapid rate of strength buildup, high adhesion to many types of porous and non-porous surfaces, high softening point, good sprayability and excellent resistance to plastic flow.

The type of laminations made in this automated adhesive bonding process to produce finished sandwich panels are: (1) non-porous to porous materials and (2) non-porous to non-porous materials. These include the bonding of porcelain coated steel, aluminum, plain steel, plastics and aluminum foil to: hardboard, wood, fiberboard, cement asbestos board and gypsum board. These

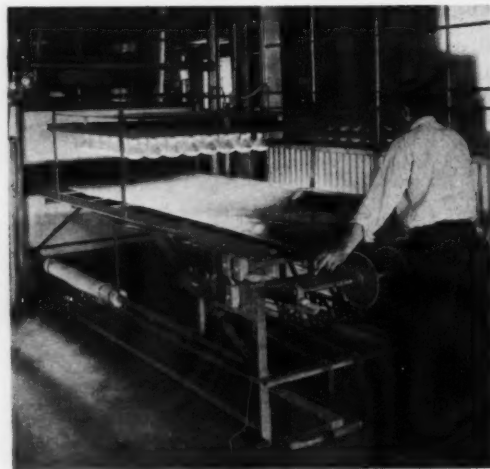
panels are primarily used in the building industry.

In the automated adhesive bonding operation, the panels to be bonded are first placed on a conveyor. The conveyor then carries the sheet material under a bank of infrared lights to remove all moisture from the sheet and also to establish a uniform temperature of the material to be bonded. It is then carried under an automatic spray system which supplies adhesive from a series of six spray guns.

The adhesive-coated sheet material is then carried under a second bank of infra red lights. In this operation the adhesive, manufactured by Minnesota Mining & Mfg. Co., is dried and heated to the required temperature for pressure bonding. Both surfaces of the core materials and the bonding surface of the facing material of the sandwich panel are adhesive-coated.

Dried adhesive-coated facing is then placed on the adhesive-coated core material and the assembly is carried between pressure rolls to insure intimate contact over the entire area and complete the bonding operation.

3-M adhesive coated sheet material is carried under a bank of infra-red lights to prepare adhesive for pressure bonding.



Announcing A NEW YALE PRODUCT FOR BOOSTING PROFITS



NEW YALE AIR HOISTS SPELL DOUBLE SAFETY

Protect Against Explosion

Protect Against Product Damage

Where your overhead handling jobs must be performed in a hazardous atmosphere, the new Yale Air Hoists provide the margin of safety you need. Air motor is explosion-proof—will not overheat. Constant variable speed-control allows smooth lifting and lowering—decreases danger of spillage or product damage. These light, compact hoists provide almost silent operation.

Maintenance is minimized due to fewer moving parts—a real economy feature.

Capacities, $\frac{1}{2}$ and 1 ton—hook or trolley models—roller or link chain—pendent or pull-cable control. For complete information on the Yale Air Hoist—newest in Yale's complete line of hand and electric hoists $\frac{1}{2}$ to 40 tons capacity—contact your Yale distributor listed under "hoists" in the yellow pages of your phone book. Or write for brochure #5145 to The Yale & Towne Manufacturing Co., Yale Materials Handling Division, Dept. AH1H, Philadelphia 15, Pa.

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TRACTOR SHOVELS • HOISTS

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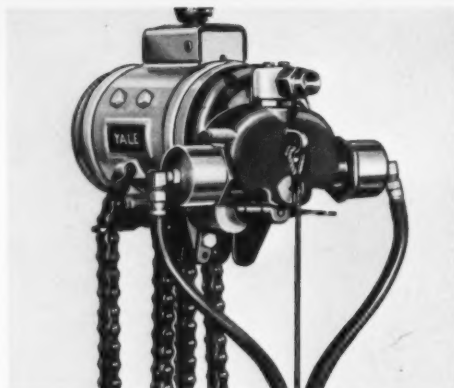


NEW YALE AIR HOISTS GIVE YOU THESE ADVANCED FEATURES

- Automatic brake locks when power is off
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- Motor cannot burn out due to overloads or high duty cycle operation
- Lightweight with maximum strength
- Fast lifting speeds
- Variable speed control
- Instant acting heavy duty brake
- Fewer moving parts to minimize maintenance

YALE PRODUCTS MEAN EXTRA PROFITS TO INDUSTRY

Yale makes available to industry the complete lines of industrial lift trucks, tractor shovels and hoisting equipment that lower production costs—speed distribution—mean greater profit margins because you get faster delivery of your products into your market—can price your product competitively for increased sales.



ROLLER CHAIN hook type hoist with lever pendent control. Available with safety catch bucket.



YALE SAFETY LATCH HOOK—viewed at load brake end of hoist showing single screw for brake adjustment which can be made without removing cover. Limit switch below the two air connections also serves for conversion to pull cable control.



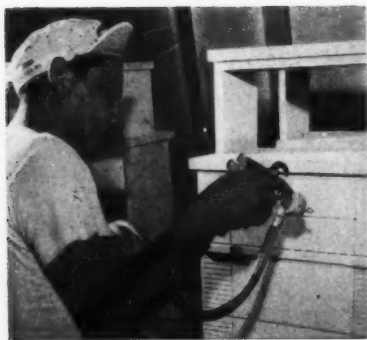
NEW SAFETY LEVER pendent control operates by fingertip—saves time and effort.

YALE®

INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS • HOISTS

YALE & TOWNE

Step up profits, production with new paint setup



Spray painter applies wash coat of lacquer. When finished, he slides piece down conveyor and another piece drops into place.

SMOOTH HANDLING is essential to the Sierra Furniture Corp., Los Angeles—it's allowed them to

case
study
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remain competitive without cutting corners on quality.

It takes careful planning.

One of the most important production facilities is spray finishing equipment for lacquers, stains and latex protective coating. Completely equipped with a system of gravity and power conveyors, work in the 50,000 sq. ft. plant moves smoothly from one manufacturing process to the next, resulting in production of more bedroom suites per month.

Coming from white goods to the 950-ft. finishing line, the various pieces, including dressers, headboards, night stands, etc., move freely on a gravity conveyor to the first spray booth. The sides, back, frame and front of the pieces are of various woods, while tops are of laminated plastic.

A friction brake on the conveyor stops the palletized piece just short of the spray booth. The spray operator then presses a switch which releases the brake and allows one pallet-load at a time to roll down in front of the spray booth.

Once in front of the spray booth, a pneumatic hoist, actuated by a foot valve, raises or lowers the work as required. The pallet can be rotated, bringing

surfaces within easy reach, but most important, the operator is not required to manhandle the piece.

Each spray booth, measuring 5 ft. wide by 10 ft. long and 8 ft. high, is equipped with a Binks Mfg. Co. Model 19 spray gun, compressor, 15-gal. pressure paint container and a Model 538-A oil and water extractor. The pieces have been thoroughly sanded before they reach this first spray booth.

After an air blast cleaning to remove any traces of the sanding operation, the furniture receives the first stain coat, applied in the dry type booth. Next, what is known as a "wash" coat is applied.

The wash coat is a thin sealer with a lacquer base and only about 5% solvent. This sealer, or air drying, has a tendency to raise any loose fibers, making them easy to remove at the next sanding station.

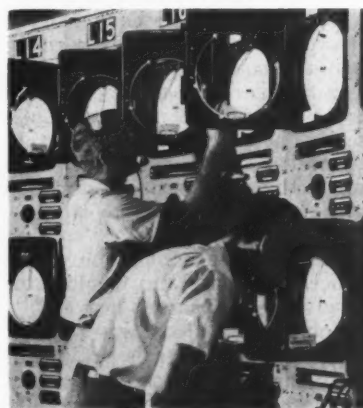
Electronic unit monitors data in rocket tests

WHEN IT COMES to rocket engine testing, you pray your recording instruments are accurate.

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study
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Engineers at the Propulsion Field Laboratory of Rocketdyne religiously use 150 Foxboro Dynalog electronic recorders to monitor results of each run or test firing of components of engines for the Redstone.

Engineers check final calibration of Dynalog Temp pressure & flow recorders at the Rocketdyne Lab near Los Angeles.



Jupiter, Atlas, Thor and other U. S. missiles.

Recorder requirements are critical. Firings are on test stands only 2,000 ft. from the control center panels. Despite severe vibration during the 30-sec. engine runs, legible records are obtained and no more than normal maintenance procedures need be carried out.

Speed and accuracy are similarly important since the chart records are used to calculate the efficiency and acceptability of each component and engine. Rocketdyne engineers test for flow, temperature, pressure, engine thrust and valve operation, all of which are logged on recorders capable of plus-minus 1/4% accuracy and at a pen speed of one second for full sweep.

High input impedance of the recorders makes it possible to use an oscillograph in conjunction with the basic recording instruments to make dynamic measurements of selected variables.

Finally, circular charts are preferred since all the test data over the full test period of one to five minutes is recorded on a single piece of paper, convenient to analyze so that corrective measures can be taken in subsequent firings.

Mechanized welding boosts production from 12 to 48 units

PRODUCTION WAS INCREASED from 12 to 48 units per day at the AiResearch Mfg.

case
study
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Division of the Garrett Corp., Los Angeles, in its process of manufacturing oil temperature regulators.

The secret of success was the use of mechanized sigma welding in place of manual welding operations.

The aluminum regulators measure 17 in. in diameter, the shell assembly being made by a combination of furnace-brazing and manual Heliarc welding. Header plates are joined to each side of the assembly by a Linde Co. SWM-2 sigma welding machine equipped with an automatically



Operator joins header plates to a regulator assembly at speed of 85 in. per minute with Linde HW-13 weld unit.

operated HW-13 torch.

Welds are made with Oxweld No. 23 aluminum wire, 3/64-in. diam., at a current of 200 amp., 17 volt, DCRP. All welds are shielded from contamination by 99.995% pure argon, the highest purity argon obtainable.

Previously, the header plates were manually welded to the regulator assembly, and it was considered good production to complete one unit every 40 min. Reaching a welding speed of 85 in. per minute, mechanized sigma welding has boosted production 300%.

Portable power tools streamline screw fastening

ASSEMBLY OF PANELS forming the top, sides and bottoms of bus coaches and fire trucks requires lots of ordinary screw fastening and tightening.

case study 31

And Crown Coach Corp., Los Angeles, would be in for a lot of costly production time if it were not for its power

Using Milwaukee Electric Tool Corp. reversing screwdriver, model 615 R, operator works on coach panels.



tools. With these tools, an operator not only can tighten panels quickly, but he can do it better and with improved quality.

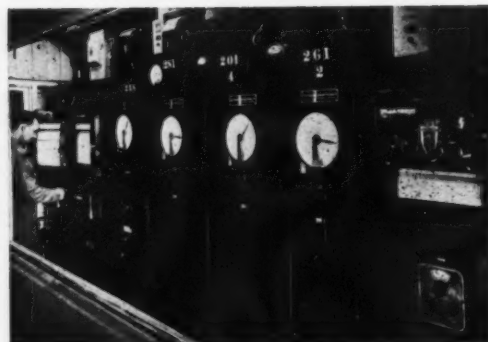
The picture shows an operator using a Milwaukee Electric Tool

Corp. reversing screwdriver, Model 615 R, to tighten down screws on a panel for the top of a coach.

With tools like these, Crown Coach Corp. has certainly speeded production and improved quality.

New electric furnace controls mean fewer rejects—less labor

Compact bank of Leeds & Northrup Speedomax type H electronic potentiometer controllers keep check on furnace temps to 1700 F.



"SUBSTANTIALLY FEWER rejects and much less labor" were the happy results when Johnson Gear & Mfg. Co. Berkeley, Calif., modernized the temperature controls of its electric heat-treating furnaces.

Johnson makes practically all types of gears and worms to specifications, but its standard right-angle gear drive illustrates the heat-treating problem common to all products.

The spiral bevel gears which connect the two shafts are made to extremely tight specs for hardness, ductility and dimension—all characteristics which require closely-controlled heat treatment.

As time has gone on, the heat-treat has required more and more attention and maintenance work in order to meet continually rising quality standards.

Analysis of the trouble pointed to a battery of elderly potentiometers. These crusty veterans were becoming more and more demanding in their requirements and also more and more likely to let temperature slide a bit . . . so that gears which passed through the process at that time would later receive the inspector's heave-ho.

Johnson's remedy was to junk the outmoded controls and install the small, compact Leeds and Northrup Co. Speedomax Type H

electronic potentiometer controllers.

Temperatures of furnaces are held to 1700 F. plus or minus 25 F. by simple on-off control, with the variations in the curve as uniform as the teeth of a Johnson gear. With this uniformity, rejects due to heat-treatment have simply disappeared.

Close tolerance deburring eased by use of brushes

DEBURRING ALUMINUM CASTINGS is a very intricate task which faces the Wm. R.

Whittaker Co., Los Angeles, manufacturer of valves, pump parts and allied products.

case study 33

With hard-to-get-at angles and very close tolerances, deburring was a problem until the company started using a Sand-O-Flex Wheel, consisting of a series of brushes arranged around a metal drum.

An abrasive cartridge inside the drum feeds strips of slashed abrasive cloth out in front of the brush . . . so that when the wheel rotates, the brush wipes this abra-



Hard-to-get-at-angles and close tolerances are precision deburred by this Merit Products' Sand-O-Flex Wheel.

sive into the most intricate corners with a soft wiping motion, and flicks out slivers and burrs and excess material with no damage or gouging of critical surfaces.

This soft wiping action enables the operator to handle the piece quickly and get an even deburring action without having to hit tiny selected spots. The wheel is easily and quickly mounted on any turning spindle in the shop, such as drill presses, an electric drill chuck, a motor shaft, lathe, etc.

The Sand-O-Flex is manufactured by Merit Products, Inc.

Phenolic-resin laminate replaces wood line covers

HERE'S HOW one firm solved three problems without increasing costs.

case study 34

By using an electrical-grade plastic laminate with good mechanical strength, Safety Live Line Co., Oakland, Calif., accomplished this:

(1) Eliminated cumbersome production problems; (2) simplified inventory; (3) markedly improved the product.

Safety Live Line produces a full

To guard against accident, line covers like these are now being made from Taylor Fibre laminate.



line of tools and protective devices for electric utility workers operating around high-voltage lines. The firm was using redwood for insulator hoods and line covers—large tubes about four ft. long and four in. in dia.—which were slipped over high-voltage lines to guard against accidental contact.

But procuring and processing redwood involved major headaches. Wood had to be carefully selected—and ordered a year in advance. It had to be air-dried for several months. Since breakage in processing ran high, keeping adequate stocks on hand meant that considerably more storage space had to be allotted than finished products would suggest as necessary.

Finally, processing required turning the line covers from solid redwood on a lathe, then boiling them in oil for 10 days. Stresses set up during processing resulted in about 40% scrap because of cracking.

Satisfying themselves that paper-base phenolic laminate was right for the job, Safety Live Line decided to substitute the phenolic for redwood. In addition to eliminating all the mess and fuss, phenolic covers are about 25% lighter and outlast redwood by about two to one.

And breakage and weathering problems have been eliminated.

Yes, by using Taylor Fibre Co. grade XX phenolic-resin, paper-base laminate, Safety Live Line Co. has solved three problems—without increasing cost.

Low amperage electrodes slash welding costs

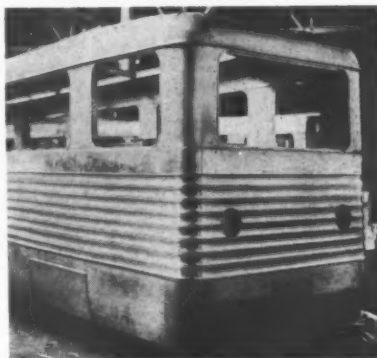
DESIGNING A RAILROAD for children requires special processes. So when companies in the Portland area contracted to build a 30-gage system for the Portland zoo, safety as well as intricate operations was stressed.

The all-aluminum cars were built by two companies using "Eutectrode" 2101 (DC), a patented low amperage electrode designed for high strength welding of aluminum alloys. A

product of Eutectic Welding Alloys Corp., Eutectrode has the specially extruded FrigidArc flux coating to ensure dense, porosity-free welds of up to 34,000 psi. tensile strength. This electrode was specified and used by the manufacturers for three major reasons:

1. Versatility. Most of the welding had to be done in-position. This meant a considerable amount of overhead and vertical work. By test, it was proven that Eutectrode 2101 gave the weldors the ability to work in tight fillet joints and maximum freedom in out-of-position joints. Burn-through, a common problem in welding aluminum with conventional high heat welding materials, was avoided with Eutectrode because of the low amperage needed. Welds were flat, dense and spatter-free. Very lit-

Safety, as well as appearance was vital in welding the body of cars for children's railroad. "Eutectrode" supplied both.



tle finishing was required as the welds had the eye-appeal necessary where riders would see them.

2. Strength. Each car was built to carry 32 children or 24 adults, meaning that close to 100 passengers could be carried on a capacity journey. Another consideration was the twisting track layout. Complete safety dictated that every weld had to provide the highest strength and ductility attainable.

3. Economy. As mentioned above, the lower amperage and lower heat input of Eutectrode 2101 avoided damage to the base metal. Freedom from spatter eliminated costly and time-consuming clean-up. These were important because the builders wanted to deliver the cars at the lowest possible cost to the zoo. The Herschberger Sheet Metal Works went so far as to test the performance of Eutectrode 2101

case study 35

against an inert gas-arc process, and found that Eutectrode 2101 was superior. This saved the company the expense of purchasing the special equipment needed for inert gas-arc, and the cost of training weldors to use it. Instead, with Eutectrode 2101, Herschberger Sheet Metal Works was able to make full use of the standard DC-generator equipment they had on hand to build the cars at the lowest possible cost.



Vacuum bell furnaces manufactured by the Hevi-Duty Electric Co. play vital part in zirconium sponge production.

Zirconium sponge production eased by new furnaces

ELECTRIC FURNACES ARE SPEEDING PRODUCTION at the Zirconium Division of Wah Chang Corp., Albany, Ore.

case
study
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Vacuum bell furnaces represent the final distillation step in the production of zirconium sponge. In this operation, the pure sponge is separated from the magnesium chloride agent which has been introduced in the immediately prior step of purification and reduction.

This zirconium sponge may be further refined by vacuum melting and machining to a metallic zirconium ingot. Present day applications are in the field of high performance jet aircraft, missiles and atomic power reactors, where the zirconium provides both light weight and very high resistance to heat and corrosion.

Wah Chang Corp. began the processing of zircon sand to zirconium sponge by the Kroll process with its first battery of six

Hevi-Duty HD-4096-S purification and reduction furnaces and eight Hevi-Duty HD-4260-S vacuum bell distillation furnaces late in 1956.

Now the company has completed its present production line-up of 21 furnaces with one more vacuum bell distillation unit manufactured by the Hevi-Duty Electric Co.

Machining strain lessened by use of square inserts

FACING AND CHAMFERING a thin cold drawn piece of metal at high speeds presented a tooling problem for Davis-Martin Engineering, Inc., Los Angeles.

case
study
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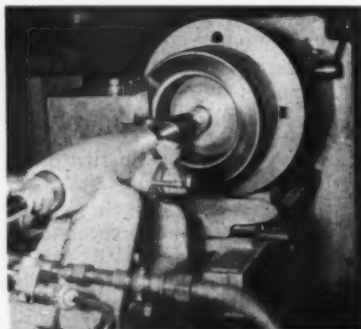
An experimental and general production machine shop, the company did not

want to distort or mar the workpiece by chucking on the 2¼ in. diameter or to machine the piece at high speed when chucked in this manner. And a quick-acting holding fixture was desirable.

The following method of holding and supporting the workpiece was developed: A wooden fixture was bolted to the face plate. The workpiece was held tightly in the fixture by a hydraulic ram in the tail stock. The inside diameter of the fixture was bored about 1/16th-in. oversize to take care of any variations in diameter of the workpiece.

Machining is performed by two square inserts. The two tools, one for facing and one for chamfering, are set up in the tool block to perform the operations in one pass.

Set in tool block to perform operations of facing and chamfering at one pass are long wearing Kennametal inserts.



Cutting speed is 2238 SFM with hand feed of approximately .009-in. per revolution. Maximum depth of cut is .020-in. Under these conditions, machining is completed in only 10 sec.

Tool life on this job is 100 pieces per cutting edge or 800 pieces per total insert life (8 indexable cutting edges). Because of the drive method used, the full life of each insert is not utilized on this job. Instead, inserts are indexed after each 100 pieces, which resulted in an average wear land of approximately .007-in. in order to minimize tool pressures. The inserts can be indexed to a new cutting edge without disturbing the holder settings. Manufactured by Kennametal, Inc., the inserts were developed for high velocity finishing at light to moderate feeds.

Good steel supply cuts inventory, adds work space

WHAT HAPPENS when you reduce inventory costs and save space?

case
study
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Simple. You can use the money and space saved to invest in increased production. That's what happened to the Dray Manufacturing Co.,

Downey, Calif. Let **James H. Dray**, president, tell the story:

"Our on-hand inventory costs have been reduced by more than 66% since we started dealing with a steel supply house. Where we once had to maintain a \$30,000 in-plant stock of cold-rolled sheet steel in thicknesses ranging from 14-gage to 24-gage, we need now carry less than \$8,000 worth on hand.

"We pay for each small order as it is delivered, rather than having to outlay large sums of money in what could turn out to be inaccurate anticipation of future needs. Not only are we now able to place our orders on the basis of day-to-day needs, but the resultant 2/3 increase of available working capital has made possible the acquisition of several additional items of modern equipment, plus the adding of advertising and sales personnel.

"The net effect of this over the

four-year period has been an increase of approximately 50 to 60% in our total production.

"Secondly, we recognize an important space-saving feature," explains Mr. Dray. "Formerly, we had to set aside 15,000 sq. ft. for inventory . . . but now we need only 5,000 sq. ft. for this purpose. This extra space represents a saving of \$700 in storage space alone, and this storage space is now occupied by added production facilities and machines.

"We can now order stock as close as one to two weeks before we intend to deliver the finished product. This makes it possible for us to adjust our production schedules to changing sales requirements, rather than having excess inventory of finished products pile up on us as demand changes.

"Also, since at least 60% of our stock is non-standard sizes, furnished to us by the supply house at no extra charge, this saves us the time and labor expense of cutting. Were it necessary for us to cut mill stock to non-standard sizes, this would add 60% to our shearing costs."

Yes, these and other savings resulted when Dray Manufacturing Co. started dealing with U. S. Steel Supply Co.

Powdered metal bearings cost less, have wide use

A POWDER METAL BEARING capable of effecting major savings for equipment manufacturers has been perfected and is now commercially obtainable.

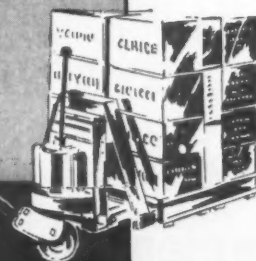
case
study
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Comprised chiefly of iron powders, bearings made from the new ferrous-base composition will cost considerably less than comparable bearings now made from porous bronze. The reason for the saving is a substantial 4 to 1 cut in the cost of constituent materials.

Subjected to exhaustive life tests and service under actual operating conditions, the new ferrous-base bearings have consistently demonstrated performance equal to porous bronze. They can

*Because this
has what
it takes...*

The rugged durability and extra value (Timken tapered roller bearings in every wheel, spring loaded non-kicking handle, slide planes for easy pallet entry and 360° lifting radius as standard) of the REVOLVATOR Red Giant hand lift pallet truck (above) has built a reputation which means that...



Red Giant
Hand Lift
pallet truck

*We were
called on
to do
this...*



Explosion-proof
High-lift
Go-Getter

One of six basic models . . . REVOLVATOR Series 54.00 Go-Getter for use in explosion hazardous areas for chemical and related companies with Class I Group D or Class II Group G hazards designed at the request of one of the country's leading safety authorities. This electric lift truck meets requirements for both hazards and utilizes screw type housings hydrostatically tested to pressures far beyond those required. Additional safety feature—hydraulically operated disc brake.

Therefore: Whether you need a standard piece of material handling equipment or specially designed equipment, call on

REVOLVATOR CO.

8798 TONNELE AVENUE, NORTH BERGEN, N. J.

... for more details, circle No. 15 on Reader Service Postcard



Ferrous-base bearings like these Oilite units, costs less through 4 to 1 savings in materials.

be used advantageously on a wide range of products where corrosion

is not a problem and mechanical strength requirements are within tolerable limits.

Suggested uses included bearing and brushing applications on home appliances, fractional horsepower motors, power tools, light machinery, instruments, light vehicles, communication equipment and other products.

A built-in service factor makes the Oilite bearings, distributed in the West by Kingwell Bros., Ltd., San Francisco, especially suitable for oscillating and reciprocating motion where the nature of the movement prevents the build-up of an oil film.

Football-field sized barges present mammoth welding task

FABRICATING SIX STEEL BARGES—each the size of a football field—takes a lot of good production planning and equipment.

**case
study
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Ask Kaiser Steel Corp., Napa, Calif. The firm fabricated the barges in 192 sections each weighing from 10 to 30 tons. The sections were loaded on flatcars and hauled to the shores of the Great Salt Lake.

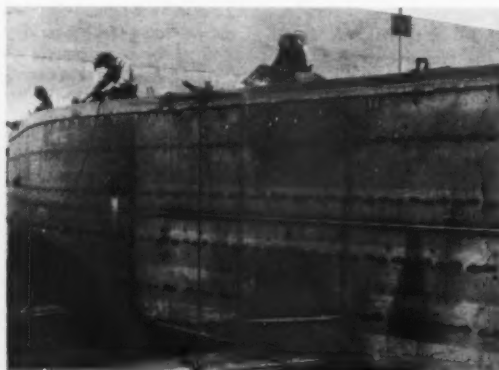
Here, workmen fitted the pieces together like giant jigsaw puzzles . . . and the barges were ready to help construct a 13-mile fill, to replace the old, outmoded wooden trestle which has carried trains across the Lake for more than half a century.

Airco (Air Reduction Co.) products played a vital part in this gigantic feat. Airco cutting equipment, with oxygen supplied from

a bulk delivery system, was used in plate preparation and fitting. Airco welding machines were used in fabricating, along with tons of Airco electrodes.

The Aircomatic process (automatic welding wire feed . . . inert-gas-shielded arc . . . flux-free welding . . . sound welds at high speeds . . . manual and automatic equipment) was used along with the Aircospot process (spot welding from one side—with a portable gun . . . using the inert-gas shielded tungsten-arc process), for a large stainless steel fabrication job.

Following the forming and corrugating of the stainless sheets, they were then lapped and spot-welded, prior to Aircomatic welding. A maximum of economy and good fit-up was essential . . . and through the use of Aircospot and Aircomatic welding, the finished job meets exacting specifications.



Perched like ants, workers use Airco cutting and welding equipment on giant barges bigger than average football field.

Pre-formed parts cut welding torch production costs

PRODUCTION COSTS WERE cut and a more efficient and durable cutting torch was produced, when the Linde Co., Los Angeles, used specially pre-formed parts for essential elements.

**case
study
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And by using die-pressed forgings and specially fabricated tube, machining operations and time were reduced and more durable parts were provided than could have been obtained with other starting materials.

Die-pressed forgings result from a method of fabrication introduced into the United States by the American Brass Co. These forgings are made from a slug cut from an extruded rod or bar. The slug is heated and pressed to shape under slow pressure in a double steel die.

The resulting shape, being twice wrought under tremendous pressure, has a dense metal structure and smooth surface, and is gas, oil and water tight.

Linde Co. fabricators found that usually there was no need for surface machining to size . . . and because the parts are free from dross or scale, tool life and cutting speeds are much higher than with cast parts.

For heavy-walled tubes, Linde used a 20% cupro nickel alloy—Ambrac 850. The tubes were produced by extruding a cylindrical blank from a hot billet and then cold-drawing to close-tolerance finished dimensions. Ambrac is a high-strength, highly corrosion-resistant engineering alloy, but with reasonably good machinability.

If Linde made these heavy wall tubes from rod, it would have been an expense machining operation with great difficulty in obtaining required concentricity of the inside diameter. Ambrac has high thermal conductivity and will dissipate heat rapidly to prevent overheating and "flashback."

Another cost-cutting part is a seamless brass tube, cold drawn

through a special die to perform the fluting. It is finished in long lengths for fast, economical cut-off and machining in automatic screw machines.

Yes, this Linde cutting torch is a representative example of how a combination of preformed parts improve a finished product at a lower production cost.

Cleaning metals in blast cabinet defeats rusting

YOU WOULDN'T USE cutters whose surface was rough or dirty, would you?

case study 42

That's why the Robert H. Clark Co., Beverly Hills, Calif., goes to so much trouble to remove scale and properly prepare surfaces on their adjustable finishing and roughing bars, carbide tipped high speed steel cutters, boring tools, spade drills, spot facer and counterbores, hole mills and hole makers.

You see, all these tools are either forged or heat treated. This creates a scaled surface. So for these quality cutters all of this scale must be removed by a blast cleaning operation—right down to the metal surface.

Then after blasting, the tools must be passed through a finger print remover and dipped into a rust preventive solution to protect the clean surface.

Also, on the carbide tipped cutters, surface preparation is extremely important in order to allow a tough bond between the metal surface and the carbide tip.

In these blasting operations, a Ruemelin blast cleaning cabinet plays an important part in the manufacture of Clark cutters.

Weldments are also cleaned by removing welding flux, stain and discoloration of the metal. All this is accomplished with an 80 mesh aluminum oxide. As this material is angular it is faster in cleaning action than rounded particles, such as silica sand.

The Ruemelin blast cabinet is also used for dry powder blasting. It will handle any type of abrasive, hard or soft, up to 325 mesh material with equal ease and without further machine adjustments.



DURABLA REDUCING COUPLINGS NOW AVAILABLE FOR USE WITH *Basic-Check* UNITS

this combination is all you need to form
a low cost, all stainless-steel check valve

Now, you can get DURABLA Reducing Couplings to match DURABLA *Basic-Check* Units. Supplied in line sizes from $\frac{3}{8}$ " to 2", they are recommended wherever a complete stainless steel (18-8) line check valve is required.

There has been no change in the *Basic-Check* Unit. It can still be used with almost any standard pipe fitting or, now, with a DURABLA Reducing Coupling. In either case, you have a complete check valve that will operate in any position—horizontally, vertically (with the inlet either up or down), and at any angle between. Suitable for almost any service—over a wide range of pressure-temperature ratings.

With a few of these units in stock you can meet practically any check valve emergency. For the full story, send for a copy of new 8-page bulletin WI 19.

DURABLA MANUFACTURING COMPANY
114 Liberty Street, New York 6, N. Y.



Basic-Check Unit
(Pat. No. 2,649,277)



Reducing Coupling



Complete Check Valve

DURABLA

Carried in stock by THE RAM COMPANY, 3936 Gage Ave., Bell (L.A.), Calif.

The dry powder blast method will produce faster and more positive results, cleaner operations with no sludge and wet floors, and lower maintenance costs—with a smaller invested cost in equipment.

Now, with all this blasting equipment, the Clark Co. doesn't have to send out its blasting work. And it's assured of a clean surface on its cutting equipment.

Selected tools at maintenance base insure efficiency

SMOOTH PRODUCTION IS ESSENTIAL at United Air Lines giant maintenance base at San

Francisco. Each year over 1,500 engines are rebuilt at a fraction of the original capital outlay — and it takes 3,800 employees and carefully planned production to duplicate the precision and efficiency of the original plane maker.

case
study
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To achieve this end, United uses drill presses that are especially adapted to particular jobs throughout the engine rebuilding line and for work other than drilling, boring and reaming, etc. A 17-in. drill press is used as a swaging tool in the retubing of engine oil coolers — making the process twice as fast as with portable pneumatic swaging tools previously used.

Grinders and abrasive belts are also kept at disassembly points throughout the shop for deburring parts as they are disassembled. Low cost and portability of these tools makes it possible to place them wherever cleaning and deburring operations might be required—eliminating the need for a department to perform these secondary cleaning operations.

In action at United Air Lines maintenance base, a Delta radial saw adds to smooth operation.



Also playing a big part in United's maintenance operations is a radial saw in the carpentry shop. It's used to cut cribbing, scaffolding, crating, etc., and like so many of the other industrial power tools used, is manufactured by the Delta Power Tool Division of the Rockwell Mfg. Co.



This 18-in. diameter vibrator separator manufactured by Southwestern Engineering Co., paid for itself in 10 months.

Vibrating screen separator speeds powder grading

PROBLEM—Western Carbide, a subsidiary of Superweld Corp., Los Angeles, manufacturer of high quality hardfacing powders, needed an efficient means of classifying the various powder sizes before mixing and packaging final product.

case
study
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Previously, all material was sized by a manually operated screen which proved to be a slow and inefficient method.

SOLUTION — The company installed an 18-in. diameter vibrating screen separator. This three-deck unit is equipped with 46, 78 and 120 mesh screen cloths. Screens are interchanged as desired to handle screening of various powder products.

RESULT—After installing the separator, manufactured by the Southwestern Engineering Co., Western Carbide immediately obtained a production rate of 550-

lb. per hr.—considerably higher than called for in its specifications.

This unit replaced the manually operated screen and resulted in labor savings that paid for the Separator in less than 10 months. All material is screened in required sizes — and there's no waste.

Ultrasonic unit measures tolerance in milling metal

MILLING METALS FOR USE at supersonic speed requires the closest tolerances. At the West

Coast Tapering Co., Inc., Los Angeles, thicknesses had to be kept at plus-minus 0.003 on airframe skins and ranging from 0.060 in. to 0.375

case
study
45

in. on aircraft panels.

This can be a tedious job. Prior to purchasing a Sonizon ultrasonic measuring instrument, skin thicknesses were measured by removing the piece from the vacuum chuck on the milling machine by means of an overhead crane, and then using a deep throat mike. This involved at least 15 min. per piece.

Now, with the Sonizon instrument, the work remains in place on the vacuum chuck while thickness is measured. The unit is mounted on a lightweight carriage with rubber casters which permit the inspector to move around the piece quickly and easily.

The ultrasonic process measures thickness from one side and shows readings by a pip on a TV type tube as rapidly as a crystal probe is touched to the test surface. By using a Harmonic Comparator, a second probe, and a calibrated tapered block, two patterns of harmonic pips show on the tube.

With the first probe on the work piece, the second is moved along the tapered block until the two patterns coincide. Exact thickness is then read from the block.

The Sonizon ultrasonic measuring instrument is manufactured by the Magnaflux Corp.

Safe cable cutter protects eye from flying steel chips

A WORKER WHO GOT AN EYE injury while cutting cable manually at Kaiser Steel's Fontana, Calif., plant, set Kaiser's safety and purchasing department to wondering how such an injury could be avoided in the future.

case study 46

The result was purchase of a Hydro-shear cable cutter, which cuts steel cable in just three easy, safe operations:

1. Cable is placed across the cutting face of the portable shear unit . . .
2. A safety catch hooks quickly into place over the cable . . .
3. A handle is lightly pressed and hydraulic action automatically cuts the steel cable in such a way there isn't a chance of flying metal.

The unit comes in three models ranging from 12 in. to 19 in. in length and from 3/4-in. rope to 1 3/4 in. rope. List price of the smaller unit is \$80, while the largest one costs \$220. There's a medium-sized unit with a capacity of up to 1 1/8 in. rope, which sells for \$120.

Note these features . . . one man can carry the unit . . . blade sharpening or replacement takes a matter of seconds and it can work in any position without need for outside power or extra tools.

It is characteristics like these that have made the cutter so universally accepted in industrial settings, and wherever the cutting of steel cable may present a safety hazard. Units are widely used on ships, and eliminate injury caused through the lazy approach to cutting—stretching a cable taut and slashing at it with an axe. A number of fatal injuries occurred from procedures like this . . . and usually to someone other than the offender.

It's more than a work-saver, it's a life-saver—and that makes it an invaluable tool for your production operation.

Manufactured by the Pell Cutter Co., the unit is distributed by the Republic Supply Co.

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- Ultra-Modern Electric Braking
- CM-ALLOY Flexible Link Chain
- Minimum-Maintenance Operation
- Lifetime Lubrication



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Liquid oxygen is the safest, most efficient oxidizer commercially available for missile and rocket propulsion systems. It is stable, non-toxic, non-corrosive, and easy to dispose of when necessary. That's why it is used in IRBM and ICBM motors.

Large volumes of liquid oxygen can be stored indefinitely in LINDE designed and built storage units — right where it is needed. Vaporization losses are minor — can be held to *less than 5 per cent per year*.

Using LINDE's methods, liquid oxygen can be transferred safely from storage — without pumps — ten times faster than previously.

LINDE can supply large quantities of liquid oxygen almost anywhere in the nation — quickly, and at a cost of only pennies per pound.

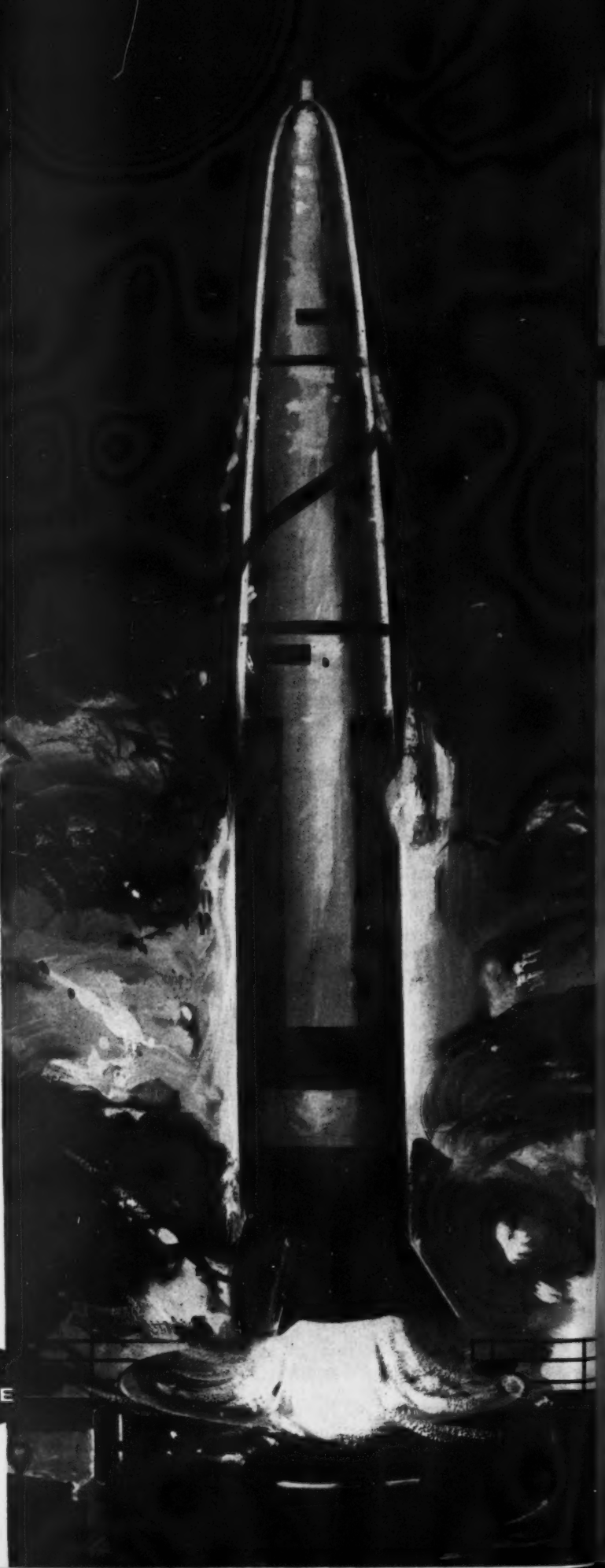
If you are concerned with the nation's vital missile and rocket development program, take advantage of LINDE's more than 50 years of experience in producing, transporting, and storing liquid oxygen. Call the LINDE office nearest you, or write: LINDE COMPANY, Division of Union Carbide Corporation, Dept. WI-1, 22 Battery Street, San Francisco 6, Calif.

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MAINTENANCE METHODS AND PLANT SERVICES

SECTION 3—WESTERN INDUSTRY'S 1959 COST REDUCTION IDEA-BOOK

Primer penetrates rust on pumps to remove scale without sanding

SALT SPRAY and wind-blown sand can really beat up water-front oil pumping units.

case
study
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The Southwest Exploration Co. of Huntington Beach knows this and was seeking some solution to these weathering conditions. The answer came in a call from a representative from Barnes & Delaney, Rust-Oleum distributor, who introduced Rust-Oleum to this organization.

Now it is no longer necessary to sandblast or chemically clean away rust because Rust-Oleum is formulated with a specially processed fish oil vehicle. It is necessary only to scrape off the loose scale, wire-brush to a sound rusted surface, and apply the Rust-Oleum 769 Damp-Proof Red Primer.

This particular primer will

Pumps like these, exposed to wind-blown salt-spray, used to rust easily until Rust-Oleum primer was used.



penetrate the rust and find a tooth to the bare metal beneath the rust. It does not destroy the rust, but incorporates it as part of the pigment by penetrating the rust and forming a moisture-proof bond to the clean surface of the metal, thereby stopping and resisting rust.

Considerable savings have resulted over the old methods of sand-blasting or chemically cleaning.

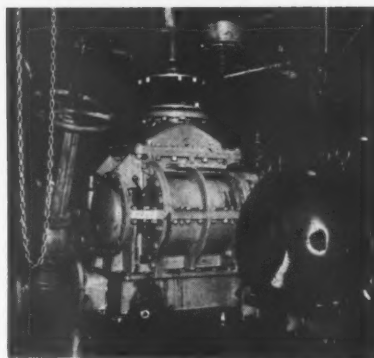
Vacuum blowers play vital part in uranium plant

VACUUM BLOWERS are playing an important part on the production line at Phillips Petroleum Co.'s uranium processing plant near Grants, New Mexico.

case
study
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The plant has 18 drum washing filters 11 ft., 6 in. in dia. by 18 ft. in length, with approximately 650 sq. ft. of filtering surface each. Three vacuum blower units, two operating and one for spare, are installed for use with these drum washing filters.

Each unit consists of a 2-stage type RCV water-sealed vacuum blower with a rated capacity of 13,000 cfm. of actual saturated inlet air at a vacuum of 29 in. of mercury referred to a 23.1-in. HG barometer. Each unit is direct-connected to and driven by a 400 hp., 720 rpm., unity power factor synchronous motor.



Uranium processing is made smooth flowing through use of Roots-Connorsville blowers, at plant in Grants, N. M.

The Phillips plant also has two Precoat drum filters, each 8 ft. in dia. by 12 ft. in length, with a filtering surface of approximately 300 sq. ft., and two yellow cake drum filters, each 4 ft. in dia. and 6 ft. in length and each with a filtering surface of approximately 150 sq. ft.

Three vacuum blowers—two operating and one spare—are installed for use with these filters. Each unit is a single-stage type RCV water-sealed vacuum blower with a rated capacity of 1,250 cfm. actual saturated inlet air at a vacuum of 18 in. of mercury referred to a 23.1-in. mercury barometer. Each vacuum blower is direct-connected to and driven by a 75 hp., 1,200 rpm., drip-proof induction motor.

Roots-Connorsville vacuum blowers were selected after a careful comparison with competitive dry type and wet type vacuum pumps for the following reasons:

(1) Lowest installed cost; (2) relatively low power requirements; (3) capable of handling liquid intrainment without mechanical damage in the event moisture trap and/or filtrate pumps fail to function properly.

Roots-Connorsville blowers are manufactured by Roots-Connorsville Blower Co., a division of Dresser Industries, Inc.

Paint arrestors in dry booths reduce maintenance costs 40%

case study 49

MAINTENANCE COSTS in spray paint operations have been reduced about 40% at Tuttle & Bailey Pacific, Inc., City of Industry, Calif., manufacturer of steel grilles, registers and ceiling diffusers.

The firm switched to dry spray booths using Paint Arrestors (Research Products Corp.). These are pads made up of several layers of expanded fiber 20 x 20 in. in either 1 or 2-in. thickness.

Pads are installed in banks in the spray booth. They collect the overspray. When pads become loaded with pigment they are removed and replaced in minutes. Down-time is at a minimum.

Paint Arrestors in a spray booth have many advantages over other paint overspray control methods. Initial cost of the spray booth and installation is considerably less because there are no pumps, no pump motors, no plumbing, minimum electrical connections (for exhaust fan only), no deflocculating reservoir.

Maintenance cost is reduced, due to less down-time, less electrical power, no water, no chemicals used to correct pH, no skimming of pigments, no pigment disposition problem, no water nozzles to clean, increased air velocity by about 33 1/3%.

An impressive installation of Paint Arrestors is at the Douglas Aircraft Co., Long Beach, Calif. Douglas is using Paint Arrestors for controlling overspray when

painting its new DC-8 Jetliner, which has an overall length of 150 ft., 6 in.; overall height of 42 ft., 4 in.; and a wing span of 139 ft., 9 in. The paint booth which holds the fuselage is 152 ft. long; 30 in. wide; and 24 ft. high.

There are 720 Paint Arrestors installed in this booth.

Ventilator units use wind currents when power is off

case study 50

VENTILATING A 280,000-sq. ft. WAREHOUSE CAN POSE A PROBLEM, and it was one that the New Certified Grocers of California, San Fernando, Calif., were prepared for in early design stages of planning.

Past experience had proved that warehouses become depressively warm if not properly ventilated, and the fumes given off by motorized equipment, if not removed, can spoil foodstuffs.

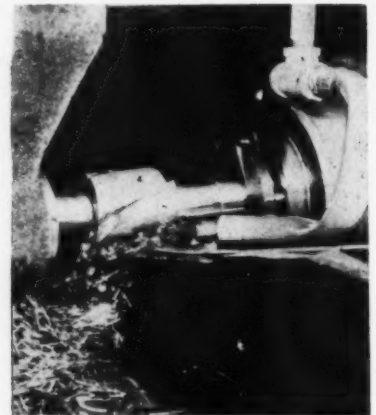
At the company's Los Angeles warehouse, 150 24-in. rotary ventilators had been installed in the roof, but they proved inadequate to exhaust air and rotate regularly. Fifty skylights, with dampers between the ventilators, were added—at tremendous cost—and only then was the warehouse properly ventilated.

So when plans were drawn up for the San Fernando warehouse, skylights were specified, but before construction began, Breidert Air-X-Hausters were brought to the attention of the plant superintendent. A demonstration of the units, showing how they eliminate back-pressure and down draft, and utilize wind currents in every direction to provide ventilation when the power is off, was impressive.

Winds from straight down-

ward to 30-deg. upward could be converted into positive suction that automatically exhausts fumes and stale air from building interiors, regardless of wind conditions.

The new warehouse uses 36 type H (36-in.) Air-X-Hauster units, plus twelve 36-in. intake propeller fans. Initial installation cost was \$19,000.



Hard metal cutting tools are protected by Chevron Oil TNC, specially intended for close tolerance machining.

Carbide cutting tools protected by special oil

case study 51

CARBIDE TOOLS ARE PROTECTED at the Experimental Specialties Co., El Segundo, Calif., by use of a cutting oil specially designed for use with hard metal cutting tools.

Called Chevron Cutting Oil TNC, it's used on tools which cut slack contour from titanium vanadium alloy with a Rockwell hardness of 68. Extreme pressure additives help the machine maintain tolerances of plus or minus .0025-in., holding rejects to a minimum.

Harry McKillip, firm's president, reports: "This oil is the most economical and efficient general purpose cutting oil I've found in 30 years in this business. It's the only one that does a real job for us on aluminum, brass,

Spraying and saving, operator knows paint overspray is collected on Research Products removable pads, cutting down-time.



Dural, HYTUF and titanium."

Experimental Specialties also uses the oil, manufactured by Standard Oil of Calif., in 40 pieces of shop equipment, eliminating the need to change oil when working different materials.

Rubber gaskets used by railroad in refrigeration

WESTERN RAILROADS were looking for a gasket that would prove effective on railroad refrigerator cars, where temperatures as low as zero were in demand.

case
study
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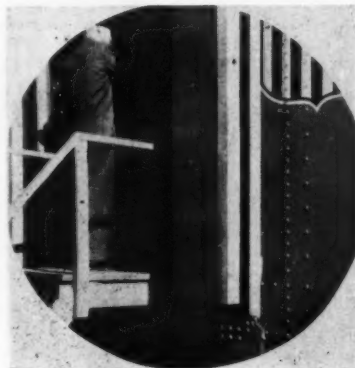
Ordinary canvas and sponge rubber gaskets proved inefficient as a seal . . . and costly in terms of operating demands on mechanical refrigeration units.

The answer to this problem was found in a new type gasket, made of a specially compounded rubber with high resilience, extremely long life, and superior resistance to extreme temperature variations.

The gasket design as developed by Robert L. Landis, Landis Industrial Co., San Jose, Calif., in cooperation with sales and research engineers of Oliver Tire & Rubber Co., Oakland, is a one-piece, easy-to-install, unit. Horizontal and vertical lengths of the gasket are of extruded manufacture; the pieces are then molded at the corners.

Oliver's experience in the production of ozone-resistant rubber components for the automobile

In use on refrigerated railroad cars is gasket designed by Oliver Tire & Rubber Co. and Landis Industrial Co., San Jose, Calif.



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Versatility in size, application, and engineering has always been a Peerless strong point. Peerless builds its own motors and matches them to the specified blower requirements. Peerless blower frames and housings are usually heavier than any competitive products. Result—a quiet, vibration-free unit.

These are not "off-the-shelf" units, but built to customer rotation and discharge specifications. Each one receives 100% inspection before it leaves the Peerless factory. Each unit is built to industry standards. Motors are built to NEMA standards. Each unit is ready for operation when received at the installation site.

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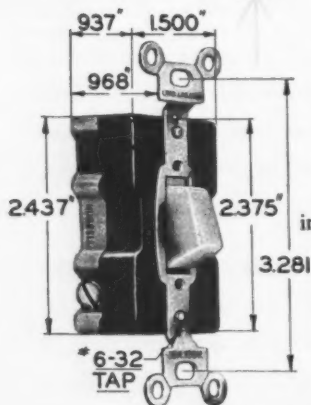
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No stumbling or fumbling in the dark to find this switch. A tiny, subminiature, neon bulb in the button is always "on" when the switch is "off", showing you right where it is, day or night. It's the last word in switch safety, luxury and convenience, . . and it costs only pennies a year to operate.

This lighted button "Presswitch" is the latest in Hubbell's complete line of "Presswitch" units, now available both lighted and unlighted and in 15 and 20 ampere ratings. All "Presswitch" devices fit standard boxes and utilize standard wall plates. No special wiring is involved.

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manufacturing industry was utilized successfully in developing a rubber formula to provide a lower installed cost, longer-lasting and efficient seal.

To date, over a half million feet of gasket have been installed, or are in process of installation on refrigerator and insulated box cars.

Pacific Fruit Express Company is a large user of this new gasket, and a growing list of users includes: Southern Pacific, Union Pacific, Western Pacific, Northern Pacific, Union Refrigerator Transit and Detroit-Toledo & Ironton Lines.

Steam vapor unit does clean job anywhere in plant

MANUFACTURING TAMALES is a messy business and cleaning by hand bucket and brush at Ingram's Chili Con Carne and Tamale Factory in Oakland, Calif., took about 7 hrs.

Now, that time has been very much reduced by using a steam vapor cleaner, gas-fired, with an electric motor driven booster water-pump . . . and the unit is used to clean the entire plant.

Called the model 60-GES, the steam vapor cleaner—by using a fully automatic nozzle control and hot cleaning solution piped to various cleaning stations in the plant—eliminates the need for a portable cleaner. All the operator need do is hook into the line wherever cleaning is required.

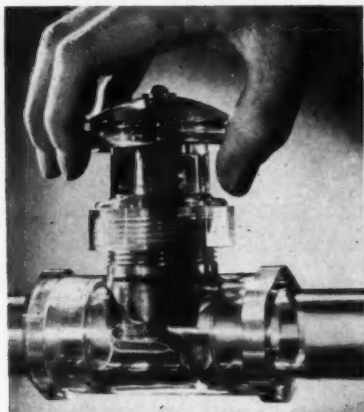
Manufactured by Malsbary

At work in a chili con carne factory, where cleanliness is a must, is steam cleaner made by Malsbary Mfg. Co.



Mfg. Co., the unit deodorizes, sterilizes and cleans meat, corn meal, grease and other dirt from kettles, pans, agitators, floors and walls of processing and cooking rooms.

Plastic fittings eliminate rust in water pipe valves



Clear plastic valves like these manufactured by Sloane Mfg. Co., keep water in system crystal clear.

RUST HAS BEEN ELIMINATED in the cooling plant at Sloane Mfg Co., Sun Valley, Calif., by use of plastic fittings, valves and pipe.

case
study
54

Water in the system remains clear of rust particles and rust coloration because the plastic pipe is not attacked by chlorine which must be added to the cooling system water to eliminate algae formation.

Clear plastic valves used in the Sloane system permit frequent inspection of the water in the system. The presence of traces of oil in the water indicates a leak in a heat exchanger and signals immediate repair.

The plastic pipe system installed in the plant supplies cooled water to heat exchangers, and the exchangers are part of the oil-cooling systems of several large plastic-forming machines in the plant.

Sloane Mfg. Co. manufactures its own plastic pipe, fittings, and valves, and supplies users throughout industry with its products.

WESTERN INDUSTRY — January 1959

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ACME finished sprockets are stocked in single widths from $\frac{3}{8}$ " to 1" pitch inclusive. 99 Sprocket tooth sizes with more than 433 different bores provide a wide selection range.

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Acme also carries a complete line of sprockets such as Grip-Master and Stock Sprockets.

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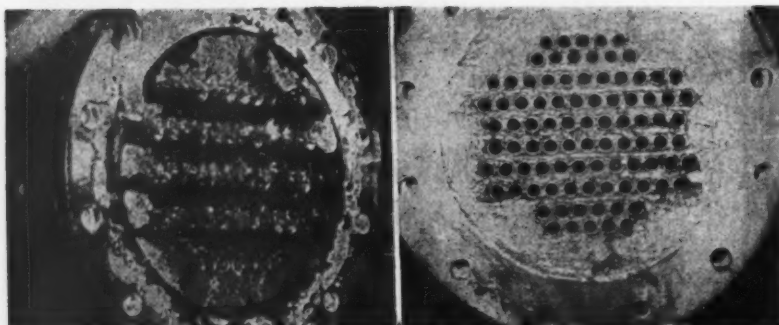
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Compressor cleaning shutdowns eliminated by water conditioner



Pictures showing condition of compressor before installation of Packard Water conditioner, and after—speak for themselves. And shutdowns have been eliminated in plants which previously closed every 40-days for cleaning.

SHUTDOWNS EVERY 40 days were a constant headache at Vulcan Steel Foundry in Oakland, Calif.

case study 55

The 705-cu.-ft. compressor had to be cleaned at these regular intervals. But now the same compressor has not had to be cleaned since February, 1957.

How come? Vulcan engineers installed a Packard Water Conditioner—a device which treats the water through powerful magnetic force fields, with the result that the physical structure of dissolved minerals or salts is changed from

scale-forming crystals to amorphous, non-adhering powder.

The photos illustrating this article show (1) the condition of the compressor at the time of the Packard installation; and (2) the condition six months later.

To test out the effectiveness of the Packard conditioner, a similar six-month test was made at the University of Santa Clara. A water tube boiler was shown to be in satisfactory condition after this period.

Packard Water Conditioners used at Vulcan Steel Foundry were distributed by Water Conditioners of Calif.

tion time was lost while melted grease was wiped away from the punches.

Cleanliness is absolutely essential—grease specks on tablets not only mean rejection, but complete regrinding, screening and separating. In addition, the presses

Shutdowns for wiping away grease result from use of Dow Corning silicone oils and greases in tablet manufacturing plant.



Silicone oils solve high temperature lube headaches

HIGH TEMPERATURE LUBRICATION PROBLEMS have been solved at Harrison Products, Inc., San Francisco, by use of silicone oils and greases.

case study 56

Wide awake production men compounding "No-Doz" tablets use special presses which produce up to 69,000 tablets per hr. During high speed production the tablet punches get so hot that ordinary organic punch lubricants melt and run down the sides of the punches.

Shut-down was necessary every 4 hours and half an hour produc-

had to be shut down once weekly for thorough cleaning, removal of hardened grease and relubrication.

But when the firm switched to Dow Corning 44 grease, shutdowns and wiping away of grease have been eliminated. And weekly cleaning and regreasing have given way to a simple relubrication operation once every 5 or 6 weeks. The silicone oils and greases are manufactured by the Dow Corning Corp.

Rubber-like compar sheets cut costs in die stripping



Die shops are raving about Resistoflex Corp's Compar sheet, a poly-vinyl resin used in die stripping.

DIE STRIPPERS and cushions can be costly. But firms—like the Becker Machine Corp., Los Angeles—have found that substantial cost savings result from using Compar sheet.

This Compar sheet, a modified poly-vinyl alcohol resin, is an elastomeric material similar to rubber. It is highly resistant to lubricating oils and solvents.

An added advantage is that the die shop man can blank out a piece of Compar with a production die, thus simplifying tooling processes. And a Compar stripper was run in excess of 100,000,000 strokes.

Also, die shop mechanics claim the material gives better wiping action, thus reducing wear on the punch section of a die set. This is particularly important on carbide dies, due to their high cost.

Compar is also available in roller form for use on paper and tin converting machinery and as solvent hose with excellent resistance to materials such as toluene and trichlorethylene. The material is made by the Resistoflex Corp., with Western Division offices in Burbank, Calif.

case study 57

Conical washers on special screws eliminate leaks

case study 58

SPECIALLY designed screws play an important part in the construction of Dudley prefabricated steel buildings, made by Dudley Steel Corp., South Gate, Calif. — and they're available for you to make profitable use of also.

Called Tuff Tite Screws, they have a conical washer which seals like a cork in a bottle, and a one-piece hex-washer head to eliminate leaks between head and washer. The undercut head traps the factory assembled neoprene washer and compresses it around the shank of the screw instead of squirting it out around the edge of the metal washer.

They're fast and easy to install... the integral metal washer assures positive socket engagement and will not deform upward to knock socket off before proper setting.

Tuff Tite screws are manufactured by the Townsend Co., at their factory in Santa Ana, Calif. They have an inventory of over 3,000,000 screws to assure wide selection and prompt shipment.

Filterator clears air line sludge while trapping oil

case study 59

AIR LINES HAD TO BE CLEARED of water and sludge condensate and oil vapor contaminants at a Southwestern aircraft manufacturing company. Contamination in the 4-in. main air line, serving approximately 1,000 air usage outlets, was causing extensive wear and damage to air operated tools and equipment.

Solution came with the purchase of a filterator which not only separates the moisture and sludge, but also filters the air of

micronic particles to as small as 5 microns, as well as trapping oil and oil vapors in an absorbant textile cartridge contained within the unit.

Over a seven month trial period traces of oil contamination were experienced only at isolated points, and they were attributed to residual contamination existing in the air system prior to installation of the filterator.

Due to temperature differentials, isolated points were found to have a free water condensate, which was corrected by installation of further filterator units.

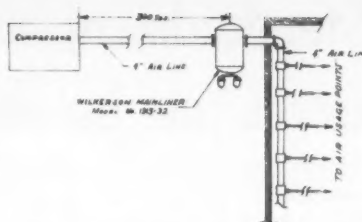


Diagram shows layout designed to clear 4-in. main air pipe through use of Filterator manufactured by Wilkerson Corp.

Total cost of installing all these Wilkerson Corp. filterators was \$4,800.00.



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2

Standardizing on steel tapes solves rule breaking problem

PROBLEM — A NATIONAL manufacturer of corrugated cartons was faced with a serious breakage and standardization problem on measuring rules used in their plant.

case
study
60

And it was accented by the fact that constant checking of

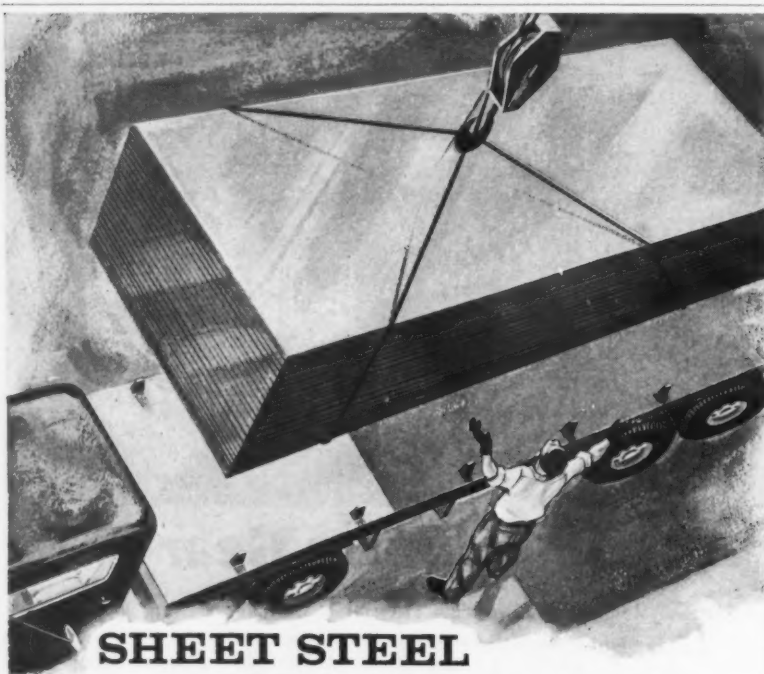
measurements throughout the entire production operation was essential. The high breakage rate was due to normal carelessness and the fact that rules were made of wood. As each operator had his own rule, no uniformity of measurement was possible.

SOLUTION—A survey of departments using measuring de-

vices was made and it was found that only two types of tape were needed . . . a 6-ft. pocket tape with 1/2-in. wide blade, and 12-ft. tapes with 3/4-in. blades that stand up straight for upright measurements.

Supplied with the tapes, at no extra cost, was a tape holder with a belt clip designed never to interfere with the wearer's normal course of work.

Of added importance, replacement blades available at each plant location can be inserted in seconds. As a result of standardizing on these two types of rules, both manufactured by the Evans Rule Co., the problems of breakage and lack of uniformity have been licked.



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From the heaviest to the lightest—Ziegler always carries large inventories of hot rolled sheets to 18-gauge . . . cold rolled and galvanized from 7-gauge to 30-gauge—in both Eastern and Western sizes. Analyses available in sheets are: 1010, 1020, 1075 and 1095. Aircraft Quality Sheets come in 4130 and 4340 as well as special alloys.

A variety of coatings—Ziegler stocks electro-galvanized (Paintlok) sheet . . . continuous hot-dipped (Bethcon), tin plated, and color-coated sheet.

Processed to your needs—call on us for shearing, roller leveling, edging, or slitting—to help keep your jobs moving on schedule.



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Steel clamps keep firm grip on jumping hoses

HOSES ARE HELD IN PLACE and stand up to extreme vibration on equipment used at the

case
study
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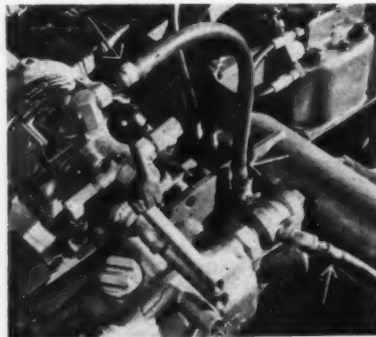
Gardner-Denver Co.'s manufacturing plant in Denver, Colo., because of the specially designed stainless steel clamps used for hose connections.

They're rust and corrosion resistant and can be quickly and easily applied. With a small hand tool and buckles, clamps of any diameter can be made from continuous rolls of stainless steel.

There is no need for hammering, punching or crimping—and they can be used for banding . . . clamping . . . bracing . . . or any other fastening need.

Steel for the clamps is manufac-

Hose is held firmly in place by these rust and corrosion resistant Band-It clamps.



... for more details, circle No. 23 on Reader Service Postcard

tured by the Crucible Steel Co., while the clamps themselves are produced by the Band-It Co.



Maintenance man sprays roof with Roofkoter, a special roofing compound manufactured by Tropical Paint Co.

Plywood roof deck, spray coat surface cut roof costs 50%

COST OF SURFACING industrial roofs has been cut 50% by a system involving plywood roof deck and spray coat surface—and it's been proved successful at the Umpqua Plywood Corp., in Roseburg, Ore.

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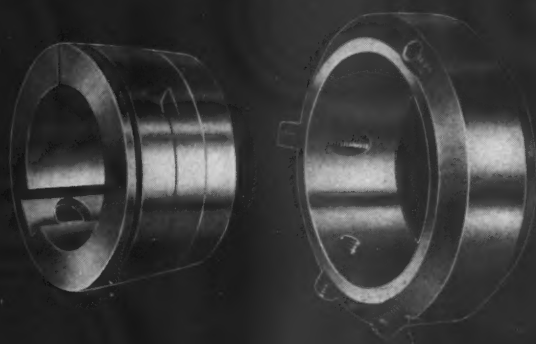
The idea eliminates conventional 3 or 5-ply build-up in favor of a plywood decking spray-coated with a flexible compound, while joints are taped.

At Umpqua Plywood Corp. the firm used $\frac{3}{8}$ -in. plywood decking over arch trusses and conventional purlins with panels blocked at all edges. One heavy coat of Roofkoter was sprayed directly on the decking, and the entire job cost one-half that of a conventional tar and paper roof.

Steps followed in waterproofing the roof at Umpqua Plywood Corp. were as follows:

The roof was swept . . . Roofkoter was sprayed over the seams to a width of 5 to 6 in. . . strips of Tropitex were embedded 3-in. wide over the seams and pressed tightly into the Roofkoter . . . then Roofkoter was sprayed over the entire roof, using 3 gal. to 100 sq.

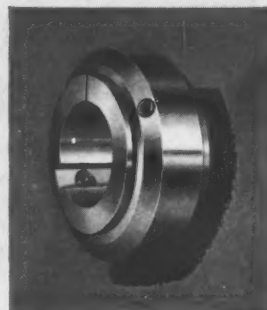
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ft. . . and six months after application the roof was sprayed with Roof Coolant, a combination of asphalt liquid and aluminum flakes.

Roofkoter, Tropitex (a heavy cotton membrane impregnated with asphalt) and Roof Coolant are all manufactured by the Tropical Paint Co.



Security is safer, surer at System Development Corp., thanks to an ultrasonic intruder detection alarm system.

Ultrasonic intruder alarm system secures plant, cuts guard costs

TOP SECRET—KEEP OUT, is a phrase very much in use at the System Development Corp., Santa Monica, Calif.

**case
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Security responsibility for this dynamic company which conducts the Systems Training Program for the Air Defense Command and assists with high speed computer programming for the new Semi-Automatic Ground Environment (SAGE) System of national air defense, is a real weight to bear.

But it's being made lighter by an ultrasonic intruder detection alarm system installed in the top secret document control room, the library's classified repository, the war gaming room, and the two basement areas where classified material is assembled and stored.

And \$70,000 a year is being saved in guard salaries.

Whenever a protected space is vacated, its door is secured with a combination lock and the ultra-

sonic system is turned on. Immediately sound at 19,200 cycles per second floods the room from a ceiling mounted transmitter about half the size of a grapefruit. The sound is monitored by a similar unit.

Anyone entering the space alters the frequency and causes the monitor to sound both visual and audible alarms at the central guard station where control panels indicate which room is reporting "intrusion." Any attempt to disconnect the equipment sounds an alarm. Under usual security procedures about fifteen men in addition to the regular force would have been required to stand round-the-clock guard duty at the locations previously mentioned.

The \$70,000 savings compares with an approximate expenditure of \$3,500 for the ultrasonic equipment which was designed by Robert Dennis of the Systems Development Corp. in conjunction with electronic engineers of the Walter Kidde Co., Inc.

Uniform tolerances of steel tubing saves goodly sum

SAVINGS OF FROM 6 TO 8 CENTS per unit have been realized by the Technibilt Corp., Glendale, Calif., since the company began depending on the uniform tolerances of mechanical steel tubing.

**case
study
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Manufacturer of a shopping cart used in supermarkets, the firm was faced with the problem of having to ream every piece of tubing used for the bottom frame of the cart.

And it was necessary because the tubing would not accept the insertion of a steel pipe needed for reinforcement of the bottom frame.

By using special size (.812-in. O. D.) steel tubing, manufactured by the Rome Cable Corp., to replace the inner steel pipe, and Rome's standard 1-in. M. S. T. with inside flash removed, Technibilt has been able to reduce the cost of the tubing used for the bottom frame and also to completely eliminate the reaming operation.

New resurfacing flooring method does the trick

FLOORS HAD BECOME pitted and uneven at McCormick & Co's. Schilling Div., San Francisco, and had to be replaced.

**case
study
65**

Because of the failure of the original reinforced concrete, a new method of resurfacing was sought.

The method selected is an absorption process involving the proper use of water-cement ratio. Installation is as follows:

- (1) Base slab is wire brushed;
- (2) dirt and any foreign matter removed;
- (3) slab is wetted, then grout coat of cement is worked in;
- (4) concrete mix is placed on base

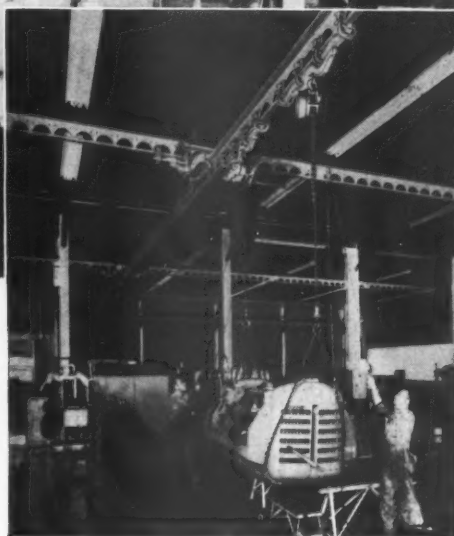
Hand Propelled Cranes Speed Repair work

Tramrail Transfer
Crane System Great
Help to San Diego Gas
& Electric Company



Lowering a power-driven post hole auger onto a line construction truck. The handy Tramrail cranes are always close at hand ready to handle jobs like this quickly. The entire Tramrail system has a rated capacity of two tons.

Hoisting a heavy air compressor. The crane is shown interlocked with a spur track. At the other end of spur track is another crane in interlocked position. If desired, the compressor can be moved directly to the far crane, thus eliminating rehandling.



HEAVERY lifts are made quickly and easily with minimum man-minutes of labor in the Repair Shop of San Diego Gas & Electric Company, San Diego, Calif., by means of a Cleveland Tramrail hand-propelled transfer crane system that covers and connects the working areas.

Because of Cleveland Tramrail's design, which provides unusually smooth, easy rolling action, hand-propelled equipment has proven satisfactory for most repair shop requirements. Of importance, too, hand-propelled cranes are low in original cost, simple to install and cost practically nothing to maintain. If it is found desirable at any time to have electric hoists and motorize bridge and carrier

motions, this can be done with nearly all Cleveland Tramrail hand-propelled systems.

Whatever equipment your materials handling situation requires — hand-propelled — electrified in whole or part — automatic — Cleveland Tramrail engineers stand ready to serve you.

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WESTERN INDUSTRY — January 1959

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Floor is glassy smooth, sound with absorption resurfacing process developed by Kalman Floor Co., Inc.



slab; (5) burlap strips are placed over floor surface and then covered with dry cement (absorption process) to help suck water to surface. This osmotic action, in turn, spreads the crushed rock evenly throughout the topping, preventing soft spots and air pockets; (6) absorption blanket is lifted after proper interval; (7) topping then receives finishing operation, including mechanical compacting, followed by hand troweling.

Absorption process concrete floors are a development of Kalman Floor Co., Inc.

Abrasive cutting becomes a snap with this machine

ABRASIVE CUTTING was a method that John Russo, operator of Russo's Sheet Metal Works, San Jose, Calif., had heard of, but never used — until he was faced with cutting to length tons of channel iron.

But first he had to find the right machine for abrasive cutting. Tests were made and resulted in an order being placed for an 18-in. general purpose cut-off machine.

Easy to operate, the cutting head and motor assembly swivels on a steel column at a point directly under the cutting wheel. Swivel handle, angle indicator

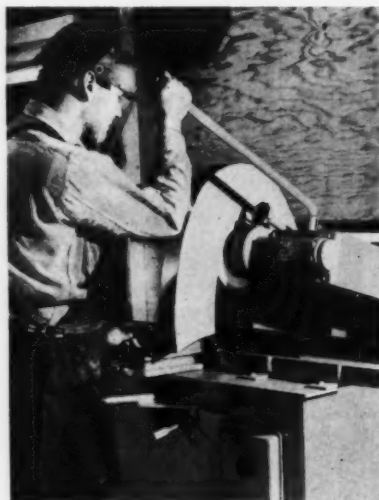
dial, and swivel lock handle are grouped close to the operator's hand. The return compression spring is adjustable for tension, and the depth stop is also adjustable by a convenient hand knob.

The model GP-18 general purpose abrasive cut-off, manufactured by the Max Mfg. Co., also gives foolproof protection to the operator. A wheel guard comes well down over the front and sides of the cutting wheel and raises and lowers with the wheel.

Now after two years of heavy industrial service, the unit in use

Operator at Russo Sheet Metal Works uses a Max abrasive cutting machine to easily cut channel iron.

at the Russo Sheet Metal Works has proved itself.



Translucent fiberglass panels provide excellent window panes

THERE WAS A WINDOW PROBLEM at the Seattle industrial plant of the U. S. Plywood Corp. Some windows were painted, others broken and needing replacement. It was decided to cover one window with a sample of translucent fiberglass panels.

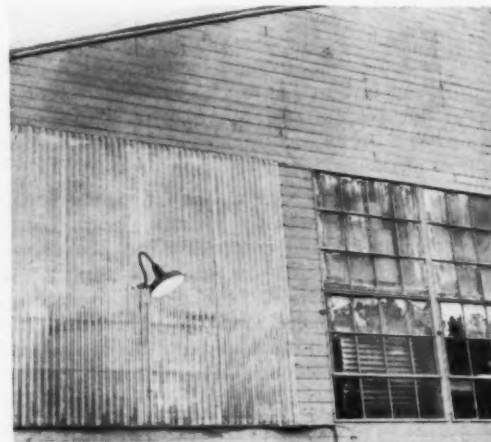
Officials liked the effect, which diffused incoming light and improved working conditions. So 6,000 sq. ft. of panels, mostly corrugated, were installed, with flat panes being used in windows which open for ventilation.

The panels feature an element

called Filtron 25, which is a heat-blocking ingredient. The panels are also shatterproof, long-wearing and require a minimum of maintenance.

Each window is covered with four sheets of 34-in. 10½-ft. series 200 industrial light green Alsynite, manufactured by the Alsynite Co. of America. U. S. Plywood's management is not only pleased with the way in which the panels beautify the building, but they are able to rest assured that broken windows have ceased to be a problem.

Photo shows comparison of before-after installation of Alsynite translucent fiberglass panels, improving appearance of building. More than 6,000 sq. ft. of Alsynite is being used in this building.





WI-1

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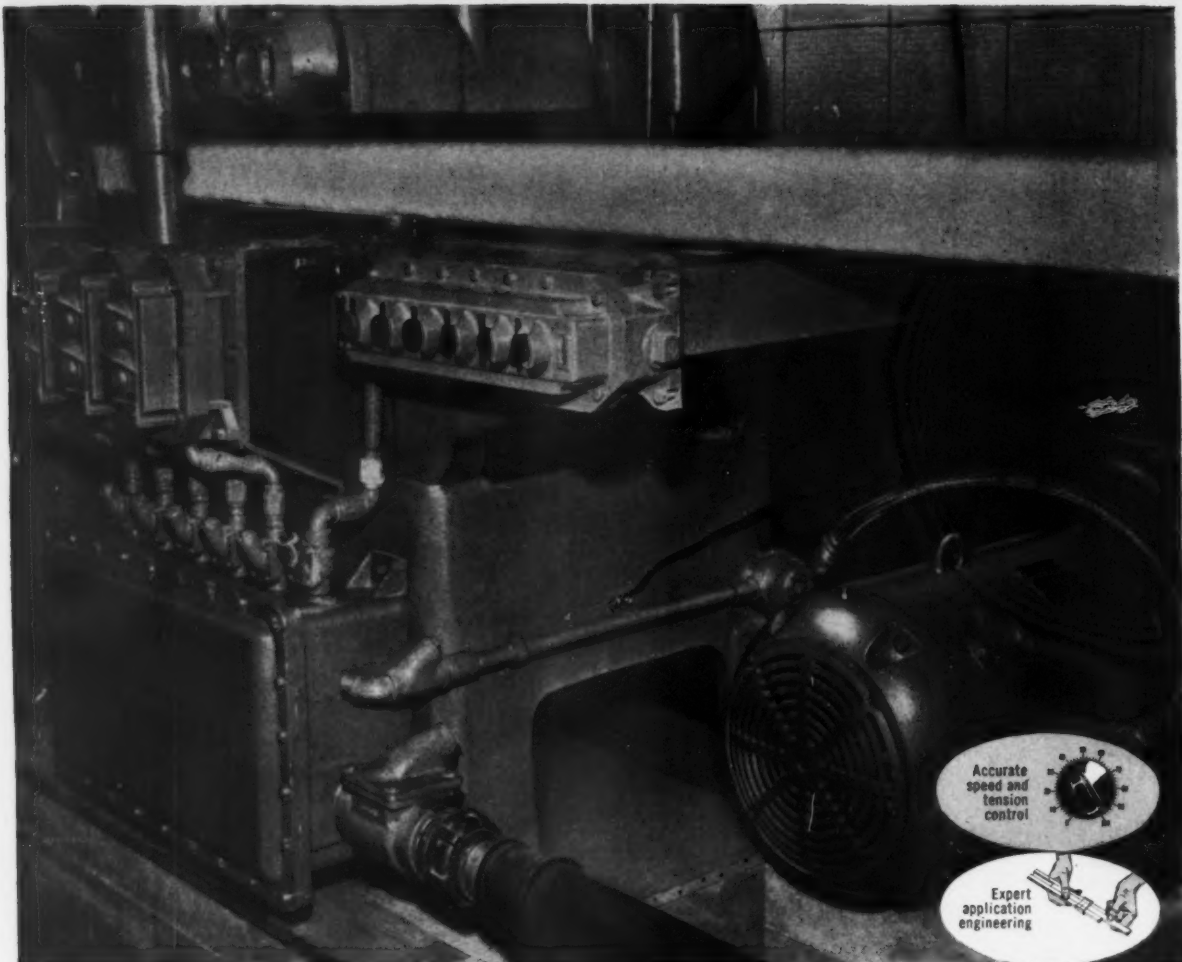
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Louis Allis Select-A-Spede® drive controls plastic-foam extrusion process — eliminates excess waste

How many pieces of equipment do you have that pay for themselves in 16 working days? That's the type of return the above Louis Allis Select-A-Spede drive brings through precise speed and tension control for continuous extrusion of plastic-foam "logs."

The old way was hit and miss — and prohibitively costly because there was no way to regulate "log" dimensions. Excessive cutting and trimming slowed down production — more material was wasted than sold — costs kited.

With Select-A-Spede, every foot of "log" comes out of the extruder in pre-set height, width, density, and weight. Only the tough outer hide has to be

trimmed off — none of the salable material winds up on the cutting room floor.

Select-A-Spede can boost your production, improve quality, and cut costs whether you're processing delicate paper tissue or wire cable — whether it controls individual drives or precision-matched multi-motor systems. Sized from ½ to 200 hp, Select-A-Spede runs on A.C. power, but furnishes precise, stepless D.C. control of speed and tension.

For complete information — or expert application help — contact your local Louis Allis District Office. Ask for Bulletin No. 2000. Or write the Louis Allis Co., 438 E. Stewart Street, Milwaukee 1, Wisconsin.

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WESTERN INDUSTRY — January 1959

POWER & MECHANICAL POWER TRANSMISSION

SECTION 4—WESTERN INDUSTRY'S 1959 COST REDUCTION IDEA-BOOK

Hydraulic power provides energy for oil well; reduces tool loss

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HYDRAULIC POWER is supplying the energy for a highly successful oil well workover unit, revamped by the Harris Production Service Co. for use in Southern California oil fields.

Specifically, the rig consists of a Wilson 96-ft. telescoping mast with a rotary table and sub-base. The mast has a telescoping hydraulic ram in the center, and one 8-in. dia. ram on each side for raising the entire assembly to a vertical position.

Two 12-in. dia. rams support the drilling table platform which is mounted on wheels for easy transportation. This use of hydraulic power to create a better drilling rig operation enables the weight problem for transportation to be reduced almost in half, while at the same time adding effectiveness on continuous production.

A group of three Denison Engineering vane pumps, all mounted

on one gear box, supply hydraulic oil at 2,000 psi. to each set of rams, pressure to each of which is directed by a manual 4-way valve and controlled by a hydrostatic type unloading or relief valve.

A Denison vane pump rated at 2,000 psi. is mounted on a separate power take-off. This pump is used to supply oil to a vane type fluid motor which in turn powers the rotary table.

The major advantage of hydraulic drive is that it allows the driller to easily control the torque exerted on the string of tubing, casing or cutting tool, by adjusting a relief valve and thereby prevent a twist-off at the bottom of the hole.

The problem of retrieving lost tools has previously consumed a great deal of needless working hours costing many dollars. Again the application of hydraulic power saved a great deal of time and expense. Speed variations are obtained by varying the speed of the pump and allow extreme flexibility in handling liner clean-out jobs as well as milling and scraping work. A vane type fluid motor, which can be operated with power off the regular hydraulic system or supplied from an auxiliary trailer-mounted hydraulic unit, is used on the tubing tongs, taking the guess work out of tube joint makeup and thereby eliminating thread damage.

These hydraulically powered tubing tongs have interchangeable jaws and bushings providing for tubing sizes from 1.660 to 4½ in. O.D. that can be changed in seconds.

A vane pump belt driven by a separate electric motor powers a

vane type fluid motor operating the mud-shaker.

A portable filtration unit is used periodically to assure clean oil at all times. This pays big dividends in a minimum of maintenance costs and unit shutdown time. An air-to-oil exchanger keeps the oil operating temperature within the manufacturer's specifications.

An additional advantage of hydraulics is the setup and knock-down time of approximately four hours for the entire rig.

At the present time the Harris unit is operating near Ventura, Calif., at a depth of about 12,000 feet, and the operators anticipate no trouble in going to depths of 20,000 feet.

With remote control, the pay-off is in reliable equipment

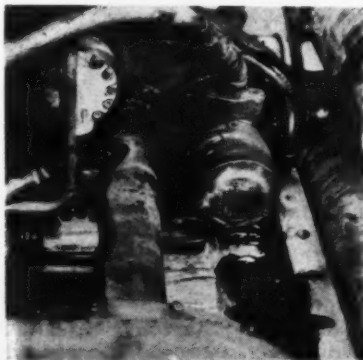
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REMOTE CONTROL of a pumping station depends mainly on reliability of equipment. You can imagine the problem if something broke down 100 miles away from the nearest maintenance source!

That's the situation at the Patterson, Calif., oil pumping station, which is controlled remotely from the Coalinga, Calif. pumping station. These stations are part of a 225-mile inland pipeline of oil built by the Union Oil Co. from its Southern California oil field to the refinery at Oleum.

Tending all pump stations would have required many men. But Union decided to build a fully automatic pump station at Patterson and hook it up by microwave with the Coalinga station. Instead of having an operator at the control panel of each station and a telephone line to link them, a dup-

Two Denison Engineering vane pumps, 2,000 psi, and a piston pump, 5,000 psi, mounted on one gear box, turn the trick.



Closeup at Coalings pumping station shows a Lufkin Foundry & Machine Co. high speed gear increaser, Model N-3010A, rated at 1,000 hp. Shaft turns at 3,600 rpm., ratio 6.74 to 1.



licate set of the Patterson signals and controls was installed at Coalings. Now an operator handles both stations via the microwave set up.

But wait. That's not the whole story. One of the main reasons these stations can be operated by one man is that the latest and most reliable equipment has been installed.

At Coalings Station are three Lufkin type High Speed Gear Increasers, ratio 6.74 to 1, rated 1,000 hp. each. At Patterson, an identical installation of three

engine - gear - pump assemblies is in operation. Driving into the Lufkin Gears are Enterprise Engines, Model No. GSG-8, fueled with natural gas, transmitting 1000 hp. at 532 rpm. Compression ratio of engines is 10.9 to 1.

Bingham Pumps are driven at speeds as high as 3600 rpm. All pumps are Bingham 10 x 10 x 12½ MSB 2-stage centrifugals, and are connected in series.

With this and other reliable equipment, there is little worry anything can go wrong. That's why the remote control setup.

Switch to batteries of nickel-cadmium saves over \$50,000

SAVINGS OF FROM \$50,000 to \$60,000 a year are estimated by Capital Airlines as a result of a

case
study
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switch from lead-acid batteries to nickel-cadmium units—most of it in maintenance and replacement costs.

Packing sufficient power to crank all six engines on the B-47 without gen-

Batteries can operate as much as 1,000 hr. without addition of water or servicing of any kind.



Air power with hand valves gives accurate line-up on log carriage

A LOG CARRIER FOR GANGSAWS has been developed by Mill Engineering and Supply Co.,

case
study
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Seattle . . . and the unit has an air-powered side motion control for faster, more accurate log line-up.

A 2 hp. Gardner-Denver air-motor drives a self-locking worm gear to move the entire carriage to the left or right on the axles.

The carriage weighs 5,000 lb., without rails, and will handle logs up to 32 ft. in length and up to 40 in. in diameter. The heavy duty all steel frame is designed to provide maintenance-free service under the most extreme demands.

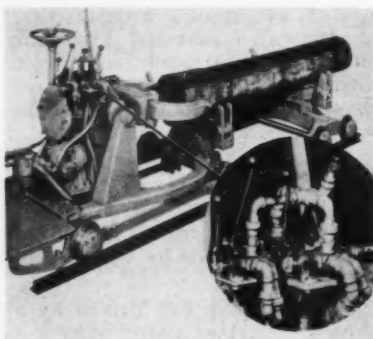
Mounted on a log rest are two safety log stops which prevent the log from rolling back off the carriage, and special jump bars mounted under the frame interlock with the track to prevent the carriage from bouncing off the track as the logs are loaded.

The 100 psi. air supply required

for the operation is controlled by three heavy duty hand valves, whose action is spring centered, allowing arms to be held in any position, minimizing resetting.

Construction of the valves, manufactured by Valvair Corp., permits easy maintenance, and they are not affected by air, water, grease or oil.

Spring-centered neutral manual valves, made by Valvair Corp., control the 100 psi. air supply for the log carriage on the newly-developed gang saw.



erator assist, the new battery is substantially lighter and smaller than conventional units . . . and it can be recharged in 30 min.

Each cell of the battery is made up of plates which have a foundation of nickel wire mesh. Sintered to mesh is a carbonyl nickel powder which forms a porous surface, giving a much larger exposed plate area than would be possible with a flat plate. Nickel oxide is the active material in the positive plate; cadmium hydroxide in the negative. The electrolyte is a 30%-by-weight solution of potassium hydroxide in distilled water.

While its initial cost is greater, the battery's long service life, expected to be several times that of conventional batteries, makes it more economical than lead-acid in the long run. The biggest saving, however, is in maintenance costs. The sintered-plate, nickel-cadmium battery can operate for as much as 1,000 hr. without the addition of a drop of water and

without requiring service of any kind. And when conversion is completed, inventory spares will amount to only 10% of the batteries in service, compared to 100% formerly.

Sintered-plate, nickel cadmium batteries are manufactured by the battery division of Sonotone Corp.

Compact "packaged" air compressor operates cheaply

A NORTHWEST lead and zinc mining company found that the air compressor supplying the great demands of air for day shift operations was unprofitable to run during reduced night shift operations.

case
study
71

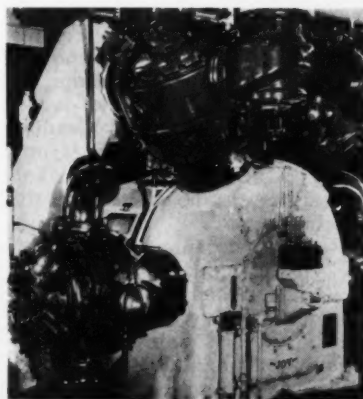
Moreover, space available for an additional compressor was limited. Most compressors in the desired capacity range required enlargement of the building which housed the equipment.

After a detailed analysis, the mining company installed a Joy WN-224, 400-hp. "packaged" air compressor. The study revealed that the Joy WN-224 offered the lowest operating cost.

What's more, the compact size of the "packaged" unit eliminated additional costs incurred by building alterations.

In addition to adequately meeting the needs of night shift operations, the compressor also serves as a dependable standby unit for the day shift.

It was unprofitable to run air compressors during night shifts until compact Joy 400-hp. units were used. Then it made sense.



Giant germanium rectifier units add 160,000 amp. boost in plating

ONE OF THE LARGEST installations of germanium rectifiers in the plating industry is producing 160,000 amp. d-c, on the automatic bumper plating line at the Fullerton, Calif. plant of Rheem Automotive Co.

The 15 and 18-v. air-

cooled units are all equipped with Inductrol automatic regulating control, making possible automatic voltage or current stabilization.

Units are housed in 5,000-amp. cubicles, with 18 of these mounted overhead to power nickel plating tanks. These 18-v. units are easily accessible from a catwalk.

case
study
72




...and SOIL-SOLV cuts elbow grease, too!

Machinery, floors or tile walls—anything washable comes clean as new with SOIL-SOLV. Any kind of glop, goop, wax, dirt or grease just floats away.

This amazing new liquid cleaner is dilutable to any strength... perfect for everything from de-greasing an auto engine, to cleaning an oven, or merely removing the soap scum from your shower rooms.

Ask for a demonstration on your "impossible" job. SOIL-SOLV is absolutely fireproof and non-toxic.





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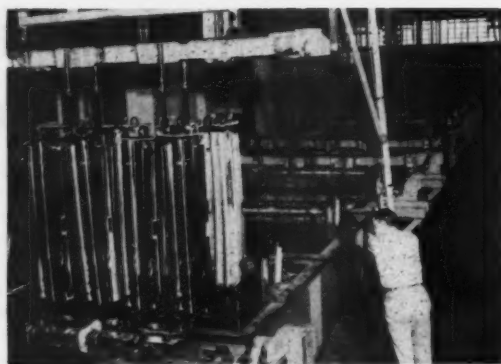
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Poised over nickel plating tanks, bumpers are readied to be dipped by operator who stands safely on catwalk between dipping tanks. Plating rectifiers in operation were supplied by General Electric Co.



Two 15,000-amp. and two 20,000-amp. units, each rated at 15-v., are floor-mounted.

The 5,000-amp. cubicles, because of their compact size (21 in. wide by 6 ft. long by 6 ft. high) and light weight (less than 3,000 lbs.), enabled a "building block" arrangement designed for maximum installation flexibility and ease of maintenance.

Each cubicle contains three blowers, five power trays and five transformers. Germanium cells are hermetically sealed from the plating room atmosphere that

would quickly cause corrosion in other types of power conversion equipment. As an added safety feature, a protective device is incorporated in each unit, which first gives a warning signal when current or temperature limits are exceeded and finally shuts the unit down automatically before damage is done.

These germanium plating rectifiers have a full load efficiency as high as 85%, resulting in reduced power costs, according to General Electric Co., which supplied the rectifiers.

Big 53,000-lb. drive problem licked by Flexidyne fluid unit

A HUGE BALL MILL, used to remove sprue and flash from cast steel balls, presented a difficult drive problem at the Capitol Foundry Division of National Malleable & Steel Castings Co., Phoenix, Arizona.

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The extreme weight of the loaded drum, trunion wheel shafts and other moving parts—a total of some 53,000 lbs.—imposed a heavy inertia load, while the slow drum speed (19.6 rpm.) required motor speed be reduced to about 78 rpm. on the trunion.

Consulting with engineers of Garrett Supply Co., distributor of power transmission machinery by Dodge Manufacturing Corp. of Mishawaka, Ind., the company worked out a compact and efficient drive that has been installed and operating for more than a year.

To support the heavy load on trunion wheel shafts, plant engineers mounted each trunion wheel

on two Dodge pillow blocks with Timken roller bearings. A Dodge Flexidyne dry fluid drive solved the problem of starting the extremely heavy load without excessive shock and with minimum horsepower.

A Size 9 Dodge Torque-Arm

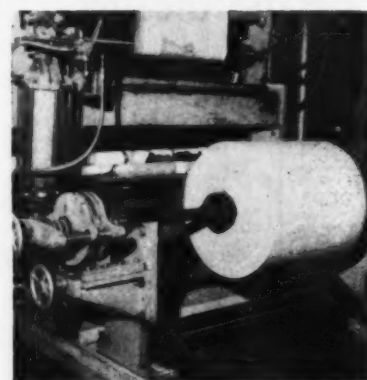
Engineers examine trunion wheel shafts and a Dodge Flexidyne drive which moved 53,000 lb. load without slip problem.



speed reducer with Taper-Lock sheaves and V-belts was mounted directly on the driving trunion shaft to achieve the exact speed reduction ratio needed.

The new drive requires little maintenance and handles the heavy load with ease.

Heavy paper rolls lifted easily with pneumatic cylinder



Lifting a 500 lb. roll of paper is this Galland-Henning pneumatic cylinder, part of specially designed mechanism.

OVER 100 MANHOURS PER YEAR WERE SAVED, and a hazardous handling task made easier, at the Western Waxide Division of Crown Zellerbach Corp., Los Angeles—by using a specially designed pneumatic roll lifting mechanism.

Using a complicated hand truck and manually lifting 300 to 500-lb. rolls of waxed paper onto a unwind stand proved to be a tedious, unsafe and expensive operation.

Then John B. MacFarland Jr., plant draftsman, solved the problem this way: First an unwind mechanism is placed into the roll and the roll is positioned on the roll lift. A control valve is actuated and a Galland-Henning pneumatic lift cylinder goes into action raising the lifting arms and depositing the heavy roll on the unwind stand.

Result—no danger to workmen and costly minutes saved. In addition to which, this specially designed pneumatic roll lifting mechanism has improved the efficiency of handling and done much to add to the morale of the workers.

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Turbine-compressor solves steam balance problem

case study 75

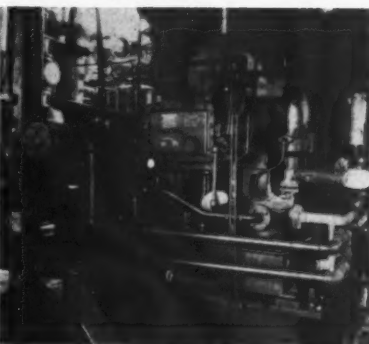
A SERIOUS STEAM-BALANCE PROBLEM was presented to Phillips Petroleum Co. with the purchase of its Ocean Refinery in Sweeny, Texas . . . to justify the huge investment involved in the refinery, attention was focused on the need to vent large amounts of steam at 40 psig.

Revisions were made in the catalytic cracking unit to increase capacity and improve product quality. Eventually, shortage of air blower and cracked gas compressor capacity remained the biggest obstacle to utilization of full catalytic cracking unit capacity. After careful study, a steam turbine-driven centrifugal compressor was selected to handle the cracked gas service.

The 2615 bhp., 8200 rpm. driving turbine, when served with steam at a minimum of 35 psig., 0 deg. superheat, and exhausting to 5 in. mercury absolute, developed a steam rate of 18.3 lb. per bhp. per hr.

Result—effective use of 48,000 lb. of steam per hr. (2,640,000 Btu/hr.) that was formerly wasted. And the unit, manufactured by the Worthington Corp., in addition to utilizing free steam, re-uses condensate in the boiler for an additional saving.

This shows the Worthington Corp. high speed turbine driving a centrifugal compressor like that at Phillips Petroleum.



Variable speed unit gives proper turn to welding rotator

case study 76

DEVELOPING A FLEXIBLE POSITIONER to rotate the large shells on concrete mixers as the seams are welded was a problem which faced the Whiteman Mfg. Co. in Pacoima, Calif.

In view of the fact that the seams are located at different radii it's necessary that the rotator be adjustable. The operations of the manufacturer are such that it's desirable that the rotator be portable so that it can be moved to the location of the shell rather than the shell moved to the location of the rotator.

Whiteman Mfg. Co. solved the problem by making up a small dolly assembly with a M-24 Zero-Max driving a small sized pneumatic tire through a gear assembly. In the fabrication of these

we're the other* Goodyear

Rubber Rolls for INDUSTRY

Goodyear rubber rolls in action in the steel industry.

The requirements of a rubber roll are extremely demanding.

They have a tough job to perform, and are expected to last a long time under severe operating conditions.

We are specialists in manufacturing rubber rolls for the graphic arts, paper and steel mills and many other industries that demand precision rubber rolls in their manufacturing process. We also manufacture to specification other rubber products that require special formulated rubber compounds. In addition to the above, we are currently serving the aviation, electronic, automotive, irrigation, petroleum, food, marine and lumber industries.

* Matter of fact . . . the original! Established 1872, we have no connection with the firm that manufactures automobile tires.

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Large concrete mixer shells are rotated for seam welding by this small dolly assembly with transmission by Revco, Inc.

shells they are mounted on trunion assemblies which are portable

and in the form of A-frames.

The dolly assembly with the small tire is moved into position so that the shells are driven by friction from the tire assembly. A remote control switch is located on the motor so that the operator in his welding position several feet from the variable speed can start and stop the rotator.

This ingenious use of the Zero-Max transmission has made it possible to solve a production problem at lower cost than would have been possible with any other variable speed transmission. Zero-Max is manufactured by Revco, Inc.

Speed changer insures quality control in intricate process

A SPEED CHANGER rugged enough to handle variations of 500 rpm. to 1200 rpm. on a 50-hp. drive motor was needed at the Santa Clara, Calif., plant of the Owens-Corning Co., manufacturer of Fiberglas.

Quality control is vital in the intricate manufacturing process, and one critical step is the curing of the binder material. This must be done in an oven operating at an elevated temperature (500 F.), with a forced draft fan blowing the hot air over the binder.

Because of the delicate nature of the binder material, complications often arose. The most frequent was caused by the binder packing with too much air pressure or, conversely, with too little air pressure, causing slow, uneven curing.

Attempts were made to control the air pressure by the use of automatic vanes and dampers on the oven draft fan. Although the system worked, it required tedious supervision and the overall quality of the binder varied from batch to batch. Also, the method was slow as the multiple vanes and dampers had to be readjusted to match the curing process.

Then it was realized that more effective control could be achieved by simply varying the speed of the fan. However, speed variation required was from a minimum of

500 rpm. to a maximum of 1200 rpm., and with a 50 hp. motor, this required the use of a very rugged speed changer.

An Ampli-Speed Magnetic Drive was selected. Manufactured by Electric Machinery Mfg. Co., Minneapolis, the drive was direct-coupled to the 50-hp. induction driving motor and then belt-coupled to the oven forced draft fan. Speed of the magnetic drives is changed by a rheostat mounted in a control panel near the drive. Speed control is manual and the desired range is quickly available. Also, once the speed is set the Ampli-Speed Drive, through its speed sensing system, will hold its speed until it is readjusted.

Results—operator can check

Rugged variations in speed changes are handled easily by this Ampli-Speed drive manufactured by Electric Machinery Mfg. Co.



quality of binder as it comes out of oven and control forced draft fan to insure top quality.

Steam traps lower consumption and costs for refinery



Insulated valve is positioned over two Yarway series 40 Hi-Capacity steam traps which eliminate dangerous air binding.

REDUCED INSTALLATION and maintenance costs as well as the lowering of steam consumption have resulted from the installation of Hi-Capacity steam traps at Richfield Oil Co.'s, Watson, Calif., refinery.

Maximum production in the modern benzene-toluene refinery requires delicate heat balances. Condensate in the system reduces the heat transfer rate robbing the operation of efficiency.

Dangerous air binding was eliminated by installing Yarway Series 40 steam traps, manufactured by Yarnall-Waring Co., which quickly changed conditions.

By simply varying the inlet steam pressure—the rest could be left up to the Hi-Capacity trap.

And in many instances a Hi-Capacity steam trap has replaced expensive liquid level float control valves installed on similar production facilities.

Yarway Series 40 Hi-Capacity steam traps were furnished and serviced by Elder Engineering Co., Los Angeles distributing firm.

PART II of our COST REDUCTION IDEA-BOOK will appear in the February WESTERN INDUSTRY. Yes, we have so many excellent cost reduction case histories on tap that we will print a second section next month. And we will bring you more time and money savings ideas in following months in our KNOW-HOW NOTEBOOK, Part I—all aimed at saving you time and money under Western plant operating conditions.

Best manuals on cranes, hoists, lifts

Yours for the asking . . . use postcard, p. 69

Lift, load heavy cargo anywhere

. . . with the Electro-Loader described in this four-pager. The brochure details a multi-purpose lift designed to provide efficient lifting and loading service anywhere in the plant. You can read how the Electro-Loader requires no ground excavation or special foundation, and can be quickly installed in both indoor and outside locations. It can be bolt-anchored to the floor or equipped with casters. Lifting is supplied by a weather-protected electric motor operating a simple cable mechanism. Platform is of checkered steel plate reinforced with steel beams. The specification diagram and chart on the back cover will fill out other details . . . and the action photos throughout the booklet will show you how the Electro-Loader can work in your plant. **Globe Hoist Co.** . . . for your copy, circle No. 150

Versatile line of overhead MH equipment

Thousands of varied handling problems have been solved by the tramrails described in this 12-page manual. They can cut handling costs 10 to 50% . . . speed production . . . save floor space . . . lower maintenance costs . . . lessen fatigue, etc. By studying this booklet, you can see how all the components of this system combine into an efficient and effective overhead handling unit. On pages 6 and 7 you can study a comparison of this tramrail over other units . . . and reasons and advantages of the tramrail. Switches are detailed on page 8 . . . and cranes and transfer cranes on page 9. Read on page 10 the section on gantry cranes (hand and motor driven) . . . and on page 11 you can learn about buckets and grabs. Everything is spelled out in descriptive photos and text. **Cleveland Tramrail Division, The Cleveland Crane & Engineering Co.** . . . for your copy, circle No. 151

48-page handbook on electric, hand hoists

Engineering tables and diagrams line up with photos and text for your inspection. And by taking a good sampling here and there you should get a pretty good idea of how hoists can fit into your operations. On display are the Zephyr all-steel lightweight (details on spur geared specifications and dimensions . . . Army trolley type . . . clevis connected type); the Model 41 spur geared (details on ¼ to 25 ton . . . differential, clevis connected, extended hand wheel, twin book, Army trolley, low head room trolley hoists); Chester Electric (specifications . . . various models . . . chain lift hoist); Trolleys (Timken Bearing . . . roller bearing . . . economy model); and hand wheels and guards. **Chester Hoist Div. of The National Screw & Mfg. Co.** . . . for your copy, circle No. 152

Documentary on all types of industrial cranes

This folder contains hundreds of pages, well-illustrated and documented, on all types of industrial cranes. Included is a four-pager on multiple runway cranes . . . 20-page booklet on single girder, motor driven cranes (the pictures alone tell an impressive story) . . . eight pages on jib cranes . . . eight pages on single girder, hand geared cranes . . . eight pages on monorail systems . . . four pages on gantry cranes . . . four pages on a telescopic portable gantry crane for production, maintenance and installation . . . eight pages on push-type cranes . . . eight pages on packaged crane end trucks . . . four pages on the original moto-trolley . . . 12 pages on heavy duty double girder overhead cranes. Winding up the folder is a multitude of fact sheets detailing every other crane for use in the West. **Borg-Warner Corp., Industrial Crane & Hoist Div.** . . . for your copy, circle No. 153

Heavy duty electric hoists that know their stuff

When you open the pages of this 24-page booklet, you'll be reading about electric hoists that have been around. Before going on the market they went through the most exacting of tests. And they were refined and refined to provide compactness and eliminate excess bulk. Incorporated into the final design are aeroplane type cooling fins to quickly dissipate heat . . . precision machining that makes the hoist over 90% efficient . . . built-in safety including fully enclosed safety type hook blocks and by not allowing more than 110 volts to pass through the push button station. These and other features are spelled out with pictures and descriptive text. The assembly drawing in the center spread spells out all other points you'd like to know. **Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.** . . . for your copy, circle No. 154

12-page manuals on new truck cranes

Twelve-page manuals are available on three new truck cranes, capable of handling up to 200 ft. of boom and jib. The 40-ton model will handle 200 ft.; the 35-ton, 180 ft.; and the 30-ton 160 ft. The manuals detail special features including power hydraulic controls, reversing clutches for either or both main drums, independent rapid boomhoist with boom lowering clutch, pin-connected crane boom, swing brake, retractable high gantry and hydraulic counterweight removal jacks. **Link-Belt Speeder Corp.** . . . for your copy, circle No. 155

Sling chain working load limit chart

Here's something that should be tacked up on every shop wall. It's an 8½ x 11-in. working load limit chart printed on wax coated heavy board. The boards can easily be wiped clean of dirt and grease so you can always refer to the vital facts. The chart gives all working load limits for single and double chain slings at 90-deg., 60-deg., 45-deg., 30 and 10-deg. All chain sizes from ¼-in. to 1¼-in. are included. A comparison of working load limits for alloy, high test steel and wrought iron is also given. The "Care and Precautions" section printed at the bottom sets down valuable safety and maintenance tips. **Campbell Chain Co.** . . . for your copy, circle No. 156

36 pages on elevators, cranes, hoists

You can start revising your thinking about elevators right now. Because this manual describes more and different types of elevators than you could ever think of. There are both portable and stationary elevators—hand and electric types—for lifting any kind of equipment you have. All models are pictured and complete specifications are given. Close-up photos show the working parts, which are thoroughly described. The section on electric hoists points out all operating features and assemblies that make these hoists efficient units. Safety features for hoists and elevators are stressed to put your safety conscience at ease. The telescopic elevators described offer exciting possibilities for versatile lifting . . . and the other elevators—portable, barrel, four post, pallet, platform loading and balcony, revolving base, and floor to floor—will set you thinking in the right direction. AND if that's not enough—you can read about portable cranes with fixed or revolving booms with capacities from 500 to 5,000 lb. WAIT! There are hoists to be considered. Both hand and electrically operated models are available, with capacities of from 500 to 2,000 lb. Yes, this book has some answers for you. **Barrett-Cravens Co.** . . . for your copy, circle No. 157

Single drum portable multi-purpose hoists

Whatever your lifting problem . . . or your source of power, you can find a single-drum, multi-purpose hoist in this 12-pager to meet your needs. The brochure describes the "Pistonair" with its reversible four- or five-cylinder motor; compact, rugged, electric models with short-length flange-mounted motors; and air-cooled, self-contained gasoline types. Features of these models are shown by cutaway photos and specification charts. Installation photos show the hoists in action. And a Select-O-Hoist chart on the back pinpoints the hoist for your operation. **Joy Mfg. Co.**

. . . for your copy, circle No. 158

Air hoists—150-lb. to two-ton capacity

Here's an eight-pager on an air hoist that's so compact and lightweight you almost expect everyone to carry one in his hip pocket. It's true that the hoist can be carried, hung and operated by one man. Is seeing believing? All right, look at the in-action pictures on page 2. Then glance at the cutaway photo on page three which reveals the guts. More photos and diagrams on the other pages round out the picture. And take a look at the "Hoistractor," which provides power for horizontal moving of loads. It can also be used to power a traveling bridge crane. **Gardner-Denver Co.**

. . . for your copy, circle No. 159

Bridges and towers for coal and ore

Bridges and towers for the unloading and stocking of coal and ore are detailed in this 12-page booklet. Information on stackers is also included, along with data on coal and ore grab buckets. Recent installations of towers and bridge unloading and stocking systems in the range of 300 to 1500 tons per hour are illustrated. Installations feature standard accessories such as barge hauling equipment and automatic hydraulic rail clamps. **Mead-Morrison Div. of McKiernan-Terry Corp.**

. . . for your copy, circle No. 160

Hoists for metal, coal, oil industries

The 24 pages of this guidebook set down the facts on hoists with almost 60 years of in-built safety and reliability. The single, double and divided drum types described can be equipped with electric motor, gasoline or diesel engine, steam or air as motive power. Designs with cylindrical or conical drums, single and double post or band brakes, friction clutches of contracting band and axial plate types or multiple tooth dental clutches are available to efficiently meet the conditions of hoisting. Hand-lever or hand-wheel operation, hydraulic or electric control of brakes and clutches are offered as requirements demand. **The Vulcan Iron Works Co.**

. . . for your copy, circle No. 161

Diesel-electric locomotive cranes

This 20-page manual introduces you to a family of champions—rugged workhorse cranes, ranging from 25 to 80 tons. The book points out—with massive photos—outstanding features of these cranes, including: ball race rotation . . . torque converter drive . . . power-positioned A-frame . . . full-view cab . . . speeds to 15 mph. . . air power brakes on hoist drums . . . push-button control for main disconnect clutch . . . and many more exclusive features. Cutaway drawings and photos hold up these assets for your inspection. And for each model, there are complete specifications and performance data. **The Wellman Engineering Co.**

. . . for your copy, circle No. 162

Lightweight cable type electric hoist

You can get all the facts on this electric powered hoist for general utility hoisting service. The compact design provides the closest head room available in cable type electric hoist construction. Powerful spur gear mechanism is permanently "Molykote" lubricated—mounted in a rugged aircraft alloy frame that has great rigidity without excess weight. Gear teeth are machine cut, hardened, shock-resistant. Lifting speeds from 50 to 7 fpm. fit widely varying requirements. Hoists operate on all standard voltage currents—are push-button controlled, with 24-v. at the box for operation safety. Loads are protected by two brakes—solenoid motor brake and heavy duty "Weston" friction type—both automatic. **David Round & Son, Inc.**

. . . for your copy, circle No. 163

Picture book on super-cranes

Pictures tell the story in this eight-pager. And the pictures show components and complete massive cranes for lifting heavy loads safely, economically, and with little effort. It takes the center spread of this booklet to give you the complete picture of the 10-ton, 100-ft. model. Also shown is the

magnetic control panels . . . operator's cab . . . welded girders and trolleys. A special section on trolleys is on pages 6 and 7, with each unit completely pictured and described. On the back are actual "on the job" shots to show you how these cranes can fit into your picture. **Northern Engineering Works**

. . . for your copy, circle No. 164

Conductor systems for cranes & hoists

Did you know that open-type high-amperage conductor systems for cranes and hoists are rapidly becoming obsolete? That's what it says in this 26-page manual. And the book goes on to tell about the Duct-O-Bar and Duct-O-Wire systems that consist of (1) a heavy-duty high-amperage conductor, (2) a collector system. The book contains a general description of the systems . . . features and advantages . . . typical installations . . . specifications . . . engineering data . . . installation instructions . . . supplying power . . . final check points. Sharp photos and diagrams help nail down the information. **Duct-O-Wire Co.**

. . . for your copy, circle No. 165

Steel derricks—2½ to 250 tons

When you lift loads worth many thousands of dollars, you don't want them to be dropped. That's why you should find out about these steel derricks that are designed and built for complete safety under all job conditions. The 36-page handbook sets down the facts on medium and heavy duty stiffleg derricks . . . heavy duty guy derricks . . . steel erector's guy derricks . . . barge mounted derricks, etc. Construction details are spelled out with pictures and text, and full page photos show actual installations of the equipment. **American Hoist and Derrick Co.**

. . . for your copy, circle No. 166

Truck and crawler cranes from 30 to 40 ton capacity

Here is a series of booklets (two 12-pagers and two 16-pagers) on truck and crawler cranes. All feature the Speed-o-Matic power hydraulic controls and the "Hi-Lite" booms and jibs that add 20 to 60 ft. in usable height to former crane boom designs. Booms and jibs are a modern, exclusive adaptation of an ancient geometric figure—the tetrahedron. A tetrahedron is made up of four triangular sides and is the strongest figure applicable to crane boom design. The booklet features revealing photos, showing intricate parts of the equipment. You'll be fascinated at the photo diagram showing—with lights—how the controls eliminate tedious shifting. **Link-Belt Speeder Corp.**

. . . for your copy, circle No. 167

Leaders in explosion- and spark-proof cranes

A leading manufacturer of explosion-proof and spark-proof cranes displays his wares for you in this eight-pager. The explosion- and spark-proof cranes have very sensitive control features and are designed for use in many of the new atomic installations, missile fuel facilities and other places which have a need for precise control and extreme spark-proofing. Other cranes featured in the booklet are: hand powered overhead traveling cranes . . . single I-beam electric crane bridges . . . electric overhead traveling cranes . . . jib cranes . . . and electric cable hoists and chain hoists and trolleys. The list of users on the back page is very impressive. **Conco Engineering Works Division of H. D. Conkey & Co.**

. . . for your copy, circle No. 168

Dual-duty hoists with hi-lo speed control

If you need extremely accurate load-spotting for handling delicate or expensive loads, then you should read this six-page folder. On page 3 it shows you performance charts of the dual-duty hoists with hi-lo speed control vs. conventional multi-speed hoists. You'll be amazed at how the dual-duty hoist delivers constant speed—regardless of load. The secret lies in the precise components of the hoist, detailed in this folder. On the back are complete specifications and typical application pictures. **Robbins & Myers.**

. . . for your copy, circle No. 169

Take loads off your mind with this air hoist

Stop worrying. You can cut down-time on maintenance and load handling with this air hoist. It will lift a 1,000-lb. load at 48 ft. per min. or a 2,000-lb. load at 20 ft. per min. Variable speed control enables operator to spot loads quickly and accurately. You can find out all about these and other facts in this four-page folder. You can see and read about capacities, components, special features, accessories and models. Cutaway photos and clear-cut text explain everything to set your mind at ease. **The Aro Equipment Corp.**

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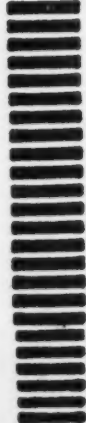
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20 pages of data on electric hoists

Packed into these 20 pages is enough information on electric hoists to make any engineer happy. With charts, diagrams, pictures, tables, pithy text, the book thoroughly explores these subjects: monorail hoists . . . 20 features of electrolift . . . worm-drive advantages . . . monorail hoist specifications, ratings, and dimensions . . . motor driven trolley monorail hoist specifications, ratings and dimensions . . . twin-hook monorail hoist ratings, dimensions and installations . . . twin-hook hatchway hoist ratings and dimensions . . . rope guide hoist specifications . . . two speed a-c hoists . . . base mounted hoists . . . current conductors and collectors. **Electro Lift, Inc.**

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Light weight aluminum hoists

This eight-pager details a hoist specifically designed for portability, high speed, high efficiency, and low headroom. The book details construction features that make the hoist light, yet extremely rugged. General characteristics are listed on page 4 and specifications on page 5. On page 6 you'll see dimensional drawings and photos . . . while on page 7 capacity ratings are set down. Pictures on the back reveal the guts of the hoist. **Ohio Hoist & Mfg. Co., Inc.**

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12 pages on air hoists and cylinders

Read about the "ideal power hoist for light and medium capacities." This manual tells about hoists that have low first cost . . . low operating cost . . . accuracy of control . . . minimum dead weight . . . immunity to overloads, etc. The engineering data sprinkled liberally throughout shows how the hoist operates and what it does. All components are pictured and described. With the attachments listed on page 8 you can set up any kind of system you want. **Curtis Mfg. Co., Pneumatic Div.**

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"Vertical transportation—1959"

The name "Otis" has been synonymous with elevators for years. But did you know that many Otis-built elevators can be used in your plant? Yes, this 32-page guidebook has many elevators for you. Like the freight elevators described on page 19. Or the light duty elevators on page 21. And be sure to study the section on power truck freight elevators, starting on page 24. These and many more elevators can be used in your plant. **Otis Elevator Co.**

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Electric hoists from 1/8 to 2-ton capacity

In a newly-revised, 12-page manual, you can get all the facts on electric hoists, ranging in capacity from 1/8 to 2 tons. These are the Lodestar models—the first truly "heavy duty" version of the small electric hoist. The number of outstanding design, construction and performance features is clearly documented. You'll be fascinated by a photograph of the Lodestar's electric brain on page 5. And on pages 6 and 7 you have complete specifications of all models. Accessories are listed on pages 8 and 9. Then take a look at the white-on-black dimension prints on pages 10 and 11. They should tell you what else you need to know about these hoists. **Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.**

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Lightweight air winch with muscles

For a little fellow, this baby sure packs the muscle. This air winch weighs only 90 lb. but will lift more than 1,000 lb. The data sheet describing this details a thousand different uses for this versatile hoist. And the specification sheet on the back lays out in concise form all the essential facts so you can see what uses you can make of it. **Joy Mfg. Co.**

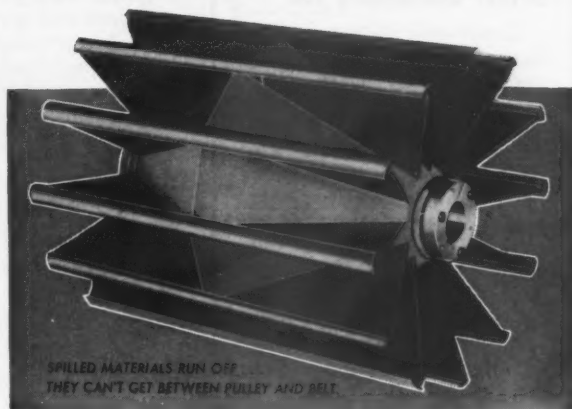
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"Overhead handling in Butler buildings"

Do you operate in a steel building? Would you like to know how to solve your handling problems? This eight-pager was specifically designed to tell you how to install low cost handling in this type of building. The book details a handling system that is quickly installed . . . simple to adjust . . . smooth running . . . readily extended . . . easily electrified . . . and has long life. Large, half-page pictures carry the story, showing actual examples of installations of the overhead system in steel buildings. Complete descriptions of the installation—and what it does—will spell out if the system can work in your steel building. **Cleveland Tram-rail Division, The Cleveland Crane & Engineering Co.**

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PULLEY with WINGS... multiplies belting life



NEW BARRY "QD" WING-TYPE PULLEY from R. & J. Dick

FOR SAFETY, ECONOMY . . . Where fluids or other waste spill on the pulley or belting, installation of this new wing-type pulley will reduce the hazard of belting breaks and minimize belting replacement costs. Foreign materials run off; they can't cause abrasive wear, or chemical reactions harmful to the strength of the belting. Also, belting wear is retarded because of the reduced area of contact between belting and pulley.

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HELPFUL LITERATURE for the West's plant operating executives

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New Ryerson data book covers aluminum, too

Ready and waiting for you is the new edition of a 256-page Ryerson Data Book that now includes aluminum analyses, characteristics, mechanical properties and tolerances, which have been added to previously published information on steel. Subjects you can learn more about from this pocket-sized gem are machining and fabricating data, manufacturing practices and tolerances, weights, safe loads, ASTM standards, compositions and properties, and miscellaneous facts of value to purchasing agents, engineers and shop men. However, don't throw away your old copy—it's not obsolete, says the publisher. The principal change in this edition is the inclusion of the aluminum data. **Joseph T. Ryerson & Sons.**

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Facts on aircraft locknut with 72% weight savings

Pictures, diagrams and tables liven up the text of this four-pager about a new-design aircraft locknut that permits weight savings to 72%, yet is just as strong as the widely used sheet metal (NAS-679) and AN series it is designed to replace. The bulletin shows how this FN-12 locknut was specially designed, how its weight compares with others—in current sizes from No. 4-40 to $\frac{3}{8}$ -24, and how it can be installed with standard tools closer to perpendicular bulkheads than standard hexagon and sheet metal hex nuts. Other supporting data on the FN-12, which has a tensile strength of more than 125,000 psi., includes a microphotograph showing continuous flow lines, graphs of torque versus induced load, and tension-mounted fatigue test results. Ordering information and specifications are also listed. **Standard Pressed Steel Co.**

... for your copy, circle No. 251

Blower bulletin discusses air, gas handling problems

How rotary positive pressure blowers and gas pumps are used to solve several air and gas handling problems is detailed and pictured in an eight-page bulletin about Sutorbilt equipment. A dimensional drawing, 17 photographs, and an illustrated discussion of the basic blower give the facts and figures of the California series. **Sutorbilt Corp.**

... for your copy, circle No. 252

Super HC V-belt 32 page design book

You can learn all about a new Super HC V-belt that packs up to three times the horsepower-carrying capacity into the same space... and provides greater horsepower per dollar invested. It's all here in this 32 page design book that contains technical tables and formulae telling how to design both stock and non-stock drives. The book also contains service level info to help determine service life of belts. And you can see how the cross section dimensions of this belt are up to 50% smaller... the narrower belt top width and groove spacing reduce sheave face width 30 to 50% which, in turn, lessens bearing loads. **Gates Rubber Co.**

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Manual deals with gaging threads for high reliability

Does your product—or your profit—hang on a thread? Could be, if you either manufacture or use screws or fasteners and realize that gaging threads is an exact, complex science. A 20-page circular about the Tri-Roll thread comparator deals with this subject, listing a dozen important advantages and stressing the versatility of the device. **Pratt & Whitney Co., Inc.**

... for your copy, circle No. 254

Cemented carbides manual describes over 50 items

First edition of a catalog that combines material previously printed in five separate booklets, "Cemented Carbides for Industry" is a 32-page manual that covers more than 50 brazed tools, inserts, tool holders and blanks. The material includes a new simplified pricing system and a new technical section featuring six special charts on the proper feeds, speeds and grades of carbide materials to use on various cutting operations. Listed for the first time in any catalog is a new Carmet cutting grade, CA-604, an extremely hard grade that contains a unique crater resistant component and is used for fine finishing with mechanically held inserts. Ordering information and distributors' addresses are also given. **Carmet Division, Allegheny Ludlum Steel Corp.**

... for your copy, circle No. 255

Crown Curve pulley—new design concept

Facts on a pulley that is said to be a totally new concept in pulley design are presented in a six-page folder about the Crown Curve type, which has no conventional center peak—the high point for belt stretch and wear. How this pulley incorporates best features of the conventional taper crown and flat-face pulley, plus improved training, mounting and general strength features is outlined in the text and emphasized with cut-away pictures and drawings. Sturdy rim construction, accurate end plate assembly and the squeeze-lock hub are among other design advantages detailed. One section is devoted to the evolution of this new pulley design; another consists of weight and dimension data plus standard bore sizes. Other industrial products of the firm are pictured and briefly described for you. **Stephens-Adamson Mfg. Co.**

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Introduction to expanded line of crank presses

The redesigned and expanded line of Niagara's straight side single and double crank presses is introduced in this 44-page bulletin packed with illustrated information on all operating and structural features of these machines. Just published, the comprehensive booklet includes useful charts and tables about punch and press speeds, detailed specifications, and a special section on the line's enclosed models. Presenting both standard and the enclosed models of the line, which has a range from 50 through 500-ton capacities, the booklet gives data on their rugged all-steel frames, box-type welded steel slide, laminated non-metallic ways, low inertia pneumatic friction clutch and brake, concealed driving mechanism and selection cushions, adjustable speed drives and automation equipment. **Niagara Machine & Tool Works.**

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Stran-Steel presents new products in catalog

Several new architectural products have been added to the Stran-Steel line, according to a new catalog which presents these for the first time. The 24-page manual gives technical information for the new items — load bearing punched channel studs, rigid frames, acoustical ceiling deck and wide rib deck—as well as for the company's entire line of joists, studs, channels, beams, C-sections, roof deck and curtain wall. Descriptions, illustrations and photographs show how each product can best be used in a variety of applications. The channel studs are 16 gage and come in five sizes with track and bridging; rigid frame assemblies come in spans from 30 to 78 ft., and in eave heights from 9½ to 19½ ft.; the new ceiling deck is available in 18 and 20 gage steel, while the roof deck, both standard rib and the new rib, comes in 18, 20 and 22 gage steel. **Stran-Steel Corp.**

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Oscillation for conveying hard-to-handle materials

If you're plagued with problems of conveying hard to handle materials, this 24-page booklet



about oscillating conveyors should prove of value. Said to describe the most complete line of such conveyors available, it describes the Flexmount, Coilmount and Torqmount types. Ranging from lightest to heaviest capacities, these three can handle material from 25 to 350 t.p.h. The well-illustrated manual gives product information on trough widths, depths, section lengths and accessories, plus selection and application data. **Link-Belt Co.**

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32 pictures to show wide scope of electric heater

There are 32—count 'em—32 illustrations in this bulletin that show how Chromalox heaters are used across industry by busy people to solve pressing heating problems. The uses fall into four categories—to keep viscous and heavy compounds moving smoothly; for ovens and special-purpose air heating; for tanks, kettles, drums, etc., and for new or converted platens and other production equipment. Typical examples of each of the general purposes include applications of both straight and curved elements to a wide range of equipment sizes and shapes. The four-page bulletin also has a chart that outlines the range of sizes, wattages, sheaths and special features available for almost 500 standard models of 11 basic Chromalox strip heater types. **Edwin L. Weigand Co.**

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Pictures point out uses of versatile storage rack

This picture presentation about storage racks emphasizes advantages of this low-cost type in grocery warehousing, in storage of perishable goods at various temperatures, frozen foods, dry products, drugs and other merchandise. The four-page folder stresses the economy and versatility of this new design P-S 58 rack that is of simple construction and easy to erect or dismantle by hand. In addition to the baker's dozen photos, the folder contains facts on assembling and how the racks are engineered to your specifications. **Palmer-Shile Co.**

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How tags can help in moving products

This four-page color brochure spells out just how tags are helpful in moving products, from raw materials through processing and on to the consumer. Two basic tags, the "systems tag" and the "informative tag," are detailed, covering such elements as basic requirements, size, components, color and copy. **Tag Manufacturers Institute.**

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Dowpac—new solution in waste treatment

Dowpac—what it is, what it provides, results it has obtained and other pertinent facts on this new plastic packing material are all explained in a 32-page brochure directed toward all concerned with waste disposal. Used in the biological oxidation of liquid wastes, Dowpac consists of individual sheets, corrugated in two directions and measuring about 3 x 3¾ in. The sheets are assembled into structurally self-supporting packing modules. The booklet will inform you more fully with its illustrated data on physical properties, assembly instruction and operational characteristics. There is also information to explain the wide design latitude possible with Dowpac and performance data gathered from pilot plant installations. **Plastics Merchandising Department, The Dow Chemical Co.**

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Lighting ideas for product designers

Here is a bright, new 24-page sketch book of ideas suggesting ways for product designers to increase the sales appeal of their merchandise by adding "built-in" lighting. The book contains 60 ideas for incorporating a wide variety of products ranging from household appliances, through vending machines to commercial displays and signs. Sketches and text point out the added sales appeal, beauty, utility and convenience, greater safety and more efficient operation that can be achieved by designing lighting into the product. **General Electric Co.**

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Versatility plus with variety of attachments

The handling unit detailed in this 28-page brochure is designed to give you full use of all your tools and horsepower. Needs of the light and medium industrial field were surveyed and a choice of power matching attachments developed to insure utmost versatility of operation with one basic unit. Work Bull 202 and 303 industrial tractors, with multi-purpose attachments, work as efficient units because they are integrated to each other. The 1001 tractor loader can be converted, with attachments, into eight different machines, while the fork lift unit has nine different attachments. Look at the pictures throughout this readable publication—and digest each word of the text. It's worth it. **Massey - Ferguson Industrial Division.**

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Fact sheets describe two pumps and a check valve

These three similar fact sheets about Mercer and Smith products give you details on the Model 1A tube vein rotary pump, Model 1B tube rotor squeeze pump and Model B 125 metering dripless check valve. Each is illustrated and gives complete data on construction and operation, cautionary notes and a price list. Gallons per minute at different speeds are listed for the two pumps, and for the check valve, flow data. **Portable Aluminum Irrigation Co., Inc.**

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2 books of maintenance tips for lift trucks

You know the old one about an ounce of prevention is worth, etc., and you probably know it's especially true when it comes to the importance of maintenance on gasoline and electric powered industrial lift trucks. Yale & Towne had this in mind when they published two 14-page booklets that describe maintenance procedures for these trucks—daily and at regular intervals. Included is a sample check chart to assure coverage of all points. **Yale & Towne Mfg. Co.**

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A reference work on clamping tools

Busy? Then it'll only take a minute to zip through this colorful manual on clamping tools. A unique color coded index, which groups all products in each category through use of different background colors, provides quick reference to all pages. Introductory pages, preceding each product category, contain a wealth of information on the latest developments in clamping tool manufacture and use. And the book contains application, construction, specifications and price data on over 400 clamping tools. **Wilton Tool Mfg. Co.**

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Facts on Teflon hose that is finger-flexible

What finger-flexibility means in terms of teflon hose for industrial and aircraft uses is revealed in a six-page folded bulletin that includes specifications and ordering data in illustrated form. The bulletin also describes the construction process developed by the manufacturers, the special Zero-motion Braiding process, the improved assembly and attachment, and the availability of large-diameter hose. The book includes a performance chart, lists some of the hydraulic and other applications, and points out distinctive features. **Titeflex, Inc.**

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16 pages about heavy-duty limit switches for industry

Three types of Micro Switch heavy-duty limit switches for industrial use are detailed in an all



new 16-page catalog that will appeal to plant engineers, maintenance men and designers of original equipment. Featured are the plug-in 206 LS series stressing quick replaceability, the compact LS series, and the rugged ML switches, available in regular or explosion-proof types. Published as a supplement to the firm's Catalog 83, this one—84—lists switches with a variety of contact arrangements for either direct or alternating current applications. Several actuator designs in each switch type are shown. **Micro Switch, a division of Minneapolis-Honeywell Regulator Co.**

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Facts on four pumps for cryogenic service

Four pumps for use with liquefied atmospheric gases are detailed in this four-page folder that gives performance and specifications data. Specially designed for liquid oxygen, nitrogen and argon service, the pumps are Models 1T-250 and 2T-300—ball bearing turbine types that offer exceptionally long service life between overhauls, and Models 47C, 50 and 150—immersed reciprocating types that are inherently maintained at operating temperatures and do not require costly cool-down periods before use. All are available with several discharge pressures and flow rates, and can be tailored to satisfy a wide range of needs. **Linde Co., Division of Union Carbide Corp.**

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54 pages on stainless steel welding fittings

In the latest revision of a catalog on Tube-Turn stainless steel welding fittings and flanges, you'll find complete dimensional data on the company's full line. The 54-page presentation includes updated technical data for allowable S-values, allowable working pressures of fittings, pressure-temperature ratings, and corrosion resistance. Corrections reflect recent code changes and conform with new code interpretations for types 304L and 316L stainless steel. Applications for stainless steel piping, welding procedures and Tube Turns' new program for packaging all its fittings and flanges are described in the catalog's introductory sections, which also lists the varied industries that use these products. **Tube Turns.**

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Bulletin explains two types of classifiers

A check-list of 13 advantages for this equipment highlights a bulletin about classifying systems for efficient separation or dedusting of dry powdered materials. Line drawings, graphs and installation photographs are included in the publication which explains general operating characteristics of both the centrifugal and the gravitational type classifiers that makes use of aerodynamic forces in ways new to this field. Additional data deals with 16 fields in which the systems may be used, as well as with operation, arrangement, power requirements, construction and pilot plant facilities. **Buell Engineering Co., Inc.**

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Eight-page bulletin tells you all about anodes

All about anodes and plating chemicals, this eight-page bulletin describes a complete line, giving details as to composition, shapes and specific application. A wide variety of anodes, anode hooks and anode bags is illustrated by photographs and line drawings, and specifications are given for round, flat, elliptical and specially shaped anodes, including nickel, cadmium brass and bronze, cop-

per zinc and lead. The bulletin also deals with the firm's recently developed Lo-Sludge nickel anodes. In a discussion of the criteria for anodes, the text emphasizes suitable metallurgical structure to promote even and uniform corrosion with minimum sludge formation, purity, chemical composition and conformation for exposure of maximum active anode area per pound. **Hanson - Van Winkle - Munning Co.**

... for your copy, circle No. 274

Industrial radiography 18 page handbook

Rapid, low-cost, industrial radiography equipment for inspection of heavy castings, weldments and fabricated parts is detailed in this 18-page manual. The book explains a versatile line of remote handling equipment for the safe exposure of very strong gamma sources. Pictures and diagrams help tell outstanding characteristics of the equipment, which include: low cost . . . versatility . . . maximum safety . . . portability . . . minimum maintenance . . . short exposure time. A wide range of systems for all types of radiography is offered. Construction, applications, specifications, safety features and operation characteristics are all thoroughly explored so you can see which system meets your needs. **Nuclear Systems, a Division of the Budd Company.**

... for your copy, circle No. 275

Here's an answer to tough cut-off jobs in industry

The modern answer to tough cut-off jobs of heavy industry—the Model 481 wet abrasive cutting machine—is the subject of a four-page folder that gives design details, operational features, work holding fixtures and complete specifications. The unit provides the speed of cutting and accuracy necessary for high production schedules and will cut solid billets, pipe or structurals, and any shape that will fit into an 8-in. circle or square. Hardened steel, titanium, high temperature alloys, corrosion-resistant metals can be cut at the rate of 8 to 10 sq. in. per minute. **Allison-Campbell Division, American Chain & Cable Co.**

... for your copy, circle No. 276

Data on continuous weigher, feeder system

A new answer to the problem of accurately weighing material continuously while in motion is offered in a four-page folder that describes a continuous weigher that can be adapted with control equipment to operate also as a gravimetric feeder. Full construction and operation details are given in the illustrated pages which also include a tabulated dimension chart; five tables for determining the size of the weigher computed by the size of the moving stream in pounds per hour and the density of the material, and data on recording equipment as an accessory. **Stephens-Adamson Mfg. Co.**

... for your copy, circle No. 277

20-page Weldirectory of manual electrodes

Called a Weldirectory, this 20-page catalog is a procedure guide for Lincoln manual arc welding electrodes for hardsurfacing and for welding stainless steels, non-ferrous metals and cast iron. It furnishes a description of each electrode, its properties and applications, and tells how to use it. You'll find charts to aid you in electrode selection and identification, plus welding machine settings for each electrode. Application pictures, cartoons and some interesting sketches, plus a pleasing color theme, team up to make this catalog a really readable and helpful reference book. **The Lincoln Electric Co.**

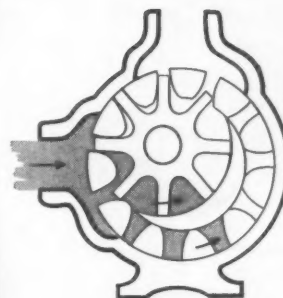
... for your copy, circle No. 278

Technical data on stainless steel tubular products

If you're an engineer, purchasing agent or otherwise in on procuring stainless tubular products, this eight-page technical data folder on the subject is a natural. It gives data on analyses, corrosion and oxidation resistance, high and low temperature characteristics, physical and mechanical properties of the family of 18-8 stainless steels. Covering tubing and pipe, welding fittings and forged steel flanges, the publication—TDC-190—includes helpful information on machining, forming, welding and other tube fabricating procedures. **Babcock & Wilcox Co.**

... for your copy, circle No. 279

WHY are Viking rotary pumps BETTER?



BECAUSE

they are Mechanically Superior

The Viking "gear-within-a-gear" pumping principle makes liquids flow into and through the pump, changing direction ever so slightly until liquids are trapped. This action cuts turbulence, foaming, cavitation and power consumption to a minimum. As a result, liquids are delivered in a smooth, positive flow . . . free of aeration.

TESTED

In test after test the superiority of Viking's pumping principle has been proved over other rotary pump action . . . and even more pronounced when handling fluids of 750 SSU and thicker. Learn the complete story on Viking rotary pumps. Send for free catalog

595A.



VIKING
Pump Company

CEDAR FALLS, IOWA, U.S.A.

In Canada it's "ROTO-KING" pumps
PACIFIC COAST DISTRIBUTORS:
Viking Pump Company of Los Angeles, 4432
Long Beach Ave., Los Angeles, Calif.; DeLaval
Pacific Co., 201 E. Millbrae Ave., Millbrae, Calif.

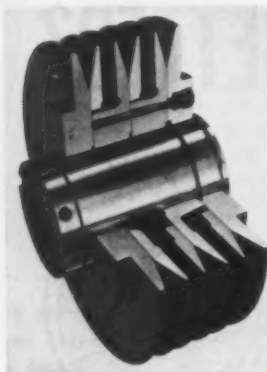
... for more details, circle No. 33

NEW EQUIPMENT for Western plant operation production, and maintenance

USE RIP-OUT POSTCARD, page 69, for more information on products described

ADJUSTABLE SPEED SHEAVE

... available for various type belts



Look at this stationary control adjustable speed sheave—the Adjustex sheave—available for A, B, and C section belts in two, three and four-groove construction. Pitch diameters parallel the former Vari-Pitch sheaves, and there's an entirely new diameter for C section belts ... 7.5/9.7-in. Design capacities to 75 hp. are covered by 33 sizes. A different concept of pitch

diameter adjustment is featured in this sheave. Adjustment is made through a single adjustment screw and hollow lock screw. Relative position between stationary and movable discs is positively maintained at all pitch diameters without disc to main sleeve set screws. Adjustex sheaves offer economy through reduced initial cost, maintenance costs, lighter weight, reduced over-all length, reduced bearing loads and improved balance at all pitch diameters. The Allis-Chalmers Mfg. Co.

... for more details, circle No. 300

HYDRAULIC POWERED VIBRATOR

... makes unloading one man operation



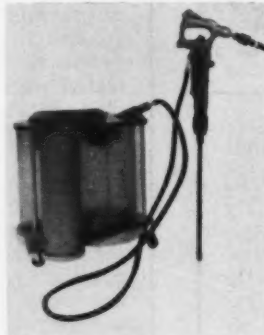
One man can quickly, easily and safely unload hopper-bottom cars, with minimum noise—and the entire operation is controlled from a hydraulic control panel. The "Carquake" utilizes hydraulically powered vibration with speed controlled to match required capacity. The two models—stationary-mounted and rail

mounted—are furnished complete. The customer need furnish only footings and electrical wiring to the push-button starter. The stationary mounted unit is designed for applications where only slight movement parallel to hopper cars and track is required, while the rail mounted unit is propelled by means of a hydraulic motor with speeds up to 50 f.p.m. It can travel any desired distance and unload at any point along its travel. Concrete piers or steel structures for anchoring the rails are all it's necessary to furnish. A distinct advantage of the Carquake is the clamping feature by which the shaker becomes an integral part of each car structure to which it is attached ... cutting off bouncing and hammering. Stephens-Adamson Mfg. Co.

... for more details, circle No. 301

DRILLING CHIPS ELIMINATED

... by air-operated suction unit



Bothered by the mess left after using a drilling machine? ... here's an air-operated unit which automatically sucks in any dust chips it creates when drilling in concrete, stone, marble, and other hard materials. The machine is designed for dustless operation in machinery installation, partitioning, water, heat, and electrical pipe or conduit drilling. It sucks

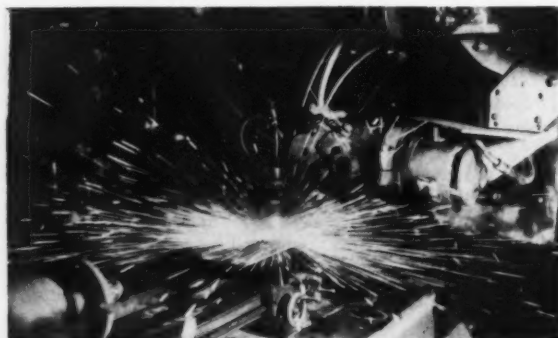
dust and chips through hollow drilling steel into the tool, and out ports in the back head into special dust-extracting tanks. The extractors are three plastic dust-collecting and air filter tanks mounted on casters for easy moving. Operating in reverse of normal blowing action, a powerful venturi air siphoning action accomplishes positive dust elimination. Thor Power Tool Co.

... for more details, circle No. 302

CONTROLLED TEMPERATURES

... makes ultra-hard material workable

A small device less than two inches in diameter that can melt the toughest materials without being itself consumed by the intense heat it generates,



is making possible accurate production of hard materials previously unworkable. Called the plasma arc torch, it works this way: The metal or substance to be worked is prepared in either wire or powder form and is then passed through an intense arc that is stuck inside the torch. It is at this point that the temperatures above 15,000 deg. are reached. Because of the enormously high heat of the arc, the material passing through is converted into a fluid or plastic state. It is then carried out of the torch by inert gases flowing at high velocity and is finally deposited on the part being made or plated with such force that a firm bond results. Linde Co., division of Union Carbide Corp.

... for more details, circle No. 303

FALK Steelflex SPACER COUPLINGS

save time and money in industrial operations

FALK and STEELFLEX are Registered Trademarks

Cut disconnect-reconnect time by as much as 50%

The FALK Spacer Coupling is specially designed for quick installation or removal *without disturbing the driving or driven unit*. This feature can save you up to 50% in disconnect-reconnect time when critical equipment—a process pump, for example—needs repair or replacement.

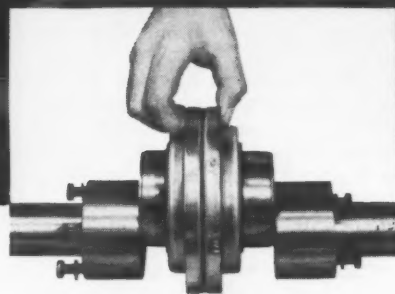
Here's another saving: with the FALK Spacer Coupling, you can quickly realign shafts *without the usual loss of operating temperature!*

And still another: you can remove or reinstall the FALK Spacer as a unit *without draining the lubricant*.

Because of its exclusive grid-groove Steelflex design, the FALK Spacer can accommodate residual misalignment—parallel, angular, or (most important) *both*. Also, it provides torsional resiliency that cushions shock and vibration. Thus it saves wear-and-tear on your connected equipment.

To prove these claims and enjoy these savings, install a FALK Spacer on one application—and see for yourself. Consult your FALK Representative or Authorized Distributor.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in many principal cities.

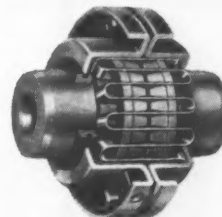


EASY AND QUICK TO INSTALL, DISCONNECT OR RECONNECT

First, mount shaft hubs to allow proper distance between hubs; then, align driving and driven units.

Second, compress Spacer to fit space between hubs and tighten cap screws to pull spacer hubs into the registered fit.

To disconnect, reverse the second step. No draining of lubricant necessary.



The heart of the FALK Spacer
...the basic Type F Steelflex
Write for Service Manual 4838

FALK
...a good name in industry

MATERIALS FLOW LINE ... built into work bench

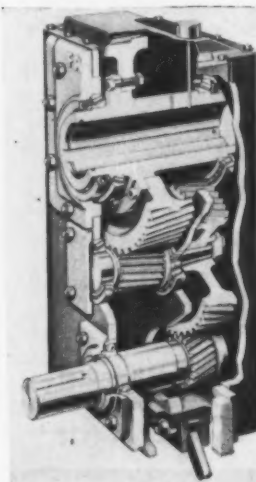
A work bench with a built-in materials flow line is available in lengths from 5 to 60 ft., in 2½-ft. increments, and with belts from 4 to 24 in. wide.



The new Table-Veyor incorporates features that lend additional versatility and make it ideal for assembly, inspection, checking, sorting, testing operations, small-order packing, etc. Spread of longitudinal bracing is always outside of the belt unit, giving full stability even when work tables are incorporated on one side only. Width of working area also can be changed along length of the belt. Mounted on stands which are adjustable to obtain correct working height, the unit can be lagged to the floor for permanent installation or mounted on casters for portable use. Standard lengths of units are 5, 7½ and 10 ft.; bed widths range from 18 to 48 in., in 6-in. increments. Normally equipped with variable speed, the unit can be obtained with fixed speed. Motors come in ¼, ½ and ¾ horsepower ratings. The Rapids-Standard Co., Inc.

... for more details, circle No. 304

SHAFT MOUNTED DRIVE ... increases torque capacity



Increased torque rating is a feature of this all-steel shaft-mounted drive, with a rating of 41,000 lb.-in. at the low speed shaft. With a ratio of 25:1, this unit covers a range of applications from 3 hp. at 5 rpm. to 30 hp. at 50 rpm. Worth special note are its extra-depth, high pressure angle helical gears with 12-15% greater load carrying capacity and more mechanical efficiency than ordinary helical gears; all-steel three-wall housing to maintain rigid alignment of revolving elements and to withstand external impact; inspection covers to check gears and bearings; and a dip-stick for quick check of oil level. The Falk Corp.

... for more details, circle No. 305

FORK TRUCK ADAPTER ... permits lowering below floor-level



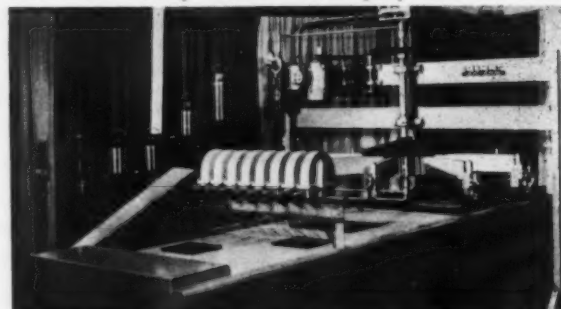
Multi-level handling is being efficiently carried out at Empire Steel Castings Company, through use of a lift truck equipped with 48-in. forks and a special fork adapter which permits lowering of load 84 in. below floor level into a quench tank. Maximum lift is 12 ft. Over-all lowered height is less than 8 ft. For added safety

and comfort, the 6,100-lb. capacity lift truck is also equipped with an overhead guard, plus a transparent heat shield and drive tire heat shields. The elevator principle can be adapted for use in a variety of industries having special multi-level production or storage problems: both capacity and height-of-lift can be tailored to meet the needs of specific applications. Towmotor Corp.

... for more details, circle No. 306

AUTOMATIC SPRAY MACHINES ... controlled by electro-mechanism

A control mechanism, for use on either rotary or vertical and horizontal automatic spraying machines has substantially reduced overspray and material

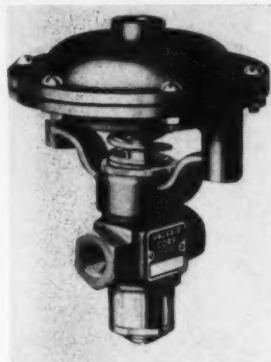


loss for any manufacturer using automatic finishing equipment. This electro-mechanical control timer is designed to control individual spray guns so that the spray pattern follows the outline of the product and actuates guns only when there is a surface to be sprayed and can effect material savings up to 45 per cent. The control can be adapted to existing reciprocating or rotary spray machines, and replacing electronic or other complicated controls. Installation is simple, the control pattern is more accurate, and there is no discrepancy. Previously, controls based on electronic network systems with elaborate synchro motors relayed the memorized pattern from the sensing location to the proper location inside the spray booth. The new control components employ a mechanical "memory" system unaffected by surroundings, simplifying maintenance. Through a precision instrument, the timer is practically indestructible, being encased in an individual housing to prevent entry of dust and dirt from surrounding processes. Rigorous tests performed with the timers have shown them to be perfectly suited to reliable operation regardless of length of service or nearby conditions. Cost is considerably less than the cost of previous systems. Binks Manufacturing Co.

... for more details, circle No. 307

DIAPHRAGM CONTROL VALVES

... for air, oil or vacuum circuits



Diaphragm operated control valves designed for activation by any 3-way pilot valve, instrument control, cycle controller or process timer, are units you should know about. Suitable for use in air, oil or vacuum circuits, the diaphragm operated valves feature neoprene covered synthetic fabric diaphragms for maximum flexibility and resistance to oil, plus extremely high bursting

strength, the manufacturer says. These valves, designed for 20 to 60 psi. air actuation, as well as for 15 psi. instrument pressure, will handle intermittent actuation pressures up to 125 psi., it is claimed. Valvair Corp. ... for more details, circle No. 308

ELECTRIC HEATER UNITS

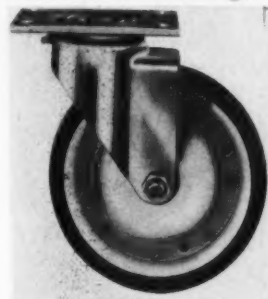
... pre-heat tapping pots

Special assemblies of electric heaters are being used to pre-heat aluminum tapping pots at the new plant of the Canadian British Aluminum Co., Ltd., and the units can work for you. The assembly consists of 8 half-circle electric tubular heating elements attached to vertical supports which are welded to a 1/4-in. thick, round steel cover plate. Elements are spaced for uniform heat distribution and the cover plate confines the heat for greater efficiency, lower heat loss. Heater ends are formed to enter two vertical boxes from where they are led out to a terminal box on the cover. A protective expanded metal screen is mounted on an angle-iron framework surrounding the heating elements. A rind is welded onto the steel cover plate to permit pickup by fork-lift truck or crane for delivery to the next job. The total rating of each assembly is 15 KW and operates on 575 volts. Heat exposure is manually timed and no electrical controls are used on any of the heating assemblies. Edwin L. Wiegand Co.

... for more details, circle No. 309

HEAVY DUTY CASTER

... ease of handling, high strength



Worth noting—a caster which combines the strength and weight capacity of a heavy duty, welded industrial caster with the handling ease and silence of operation of an institutional caster. The heavy duty industrial fork on the caster provides a capacity of 500 lb. The caster fork and the steel disk of the wheel are heavily plated. The 8-in. diameter wheel has replaceable rubber tires and hardened cup and cone bearings, while neoprene sealed swivel raceways of the fork retard accumulation of dirt and grime and retain lubrication, preventing rusting of the bearings when the unit is steam cleaned. The Colson Corp.

... for more details, circle No. 310

WESTERN INDUSTRY — January 1959

"My No. 1 choice!"

It's a workman's tool—not a toy."

Milwaukee
PROFESSIONAL POWER TOOLS

MOST POWER PER DOLLAR

THESE are drills built exclusively for professionals... for heavy duty, all day, every day use. Not intermittent duty tools or "do-it-yourselfers," but drills you can bank on to pay off in greater personal skill and output... greater profits on every job. Outpowers other drills... MILWAUKEE high-torque motors, multiple reduction gearing, full ball and roller bearings. Chuck capacities 1/4" to 1". Drills that you'll own with pride... use for a lifetime of satisfaction. Costs you more? No! Cost you less... to buy and to own. See your Milwaukee distributor or write

LOOK UNDER
TOOLS-ELECTRIC



Milwaukee Electric Tool Corporation

West Coast Factory Branches

2569 W. Olympic Blvd.
Los Angeles 6, Calif.

216 11th Street
San Francisco 3, Calif.



Model B In-Line Hole-shooter Grip
In line with the bit for pin point accurate drilling. Six models with drilling speeds from 650-5000 rpm — 1/4", 5/16" and 3/8" capacities.



S-114 Heavy-Duty Hole-shooter
Extra rugged 1/4" drill. Ideal for general maintenance or continuous service. 1900 RPM chuck speed, weighs only 3-1/4 lbs.



612 Heavy-Duty Hole-shooter In-line
design gets you in the tight spots. 1/2" chuck capacity. Full 1/2 HP motor delivers 8 ft. lbs. of torque at the chuck.

AS-9606

... for more details, circle No. 35 on Reader Service Postcard

For years
of steady service—

ELECTROLIFT

WORM- DRIVE HOISTS



- **Simple to operate**—one man control, push-button or rope
- **Built to last**—with quality parts and automatic lubrication
- **Safe**—alloy steel worm-drive brake holds loads securely
- **Compact**—no overhung gears... allow close headroom
- **Clean and quiet**—working parts are fully enclosed

Electrolift worm-drive hoists give you smooth, fast control over loads of from ¼ to 10 tons. For details on speeds and models, consult your Electrolift representative, listed in the classified directory.

ELECTROLIFT
HOISTS

204 Sargeant Avenue Clifton, N. J.

6456

... for more details, circle No. 36 on Reader Service Postcard

NEW OAKITE CLEANERS GIVE YOU MORE FOR YOUR PAINT-PREPARATION DOLLAR

Does your trouble chart show that you need better cleaners, strippers or surface conditioners?

- ☐ Too many operations needed to prepare steel for painting. See 1 below.
- ☐ Streaky stains or powdery residues on steel parts being stripped for repainting. See 2.
- ☐ Phosphating process shows poor results in salt spray tests. See 3.

FREE Ask for booklets or bulletins on:

- 1 Oakite Compound No. 131
- 2 Oakite Rustripper
- 3 Oakite Crysoat No. 89

Write to Oakite Products, Inc., 1001 E. First St., Los Angeles, or 681 Market St., San Francisco, Calif.



OAKITE

Technical Service Representatives in Principal Cities of U.S. and Canada

... for more details, circle No. 37 on Reader Service Postcard

ROTATING LIFT TABLE ... eases handling heavy objects



Rack loading operations are being made easy—thanks to a lift table with a turntable top. Design of the unit allows loading of long, heavy and cumbersome products onto a rack which is placed on the table. With a convenient foot pedal switch, the operator can adjust the height of the table so that there is always an empty space on the rack at a convenient working height. Before installation of the table the operators had to lift the products high to the upper rungs of the rack, often damaging the product. When one side of the rack is filled, it can be turned around as it is resting on the turntable. The tables can be furnished in capacities up to 30,000 lb. and custom made units are available for special applications. **West Bend Equipment Corp.**

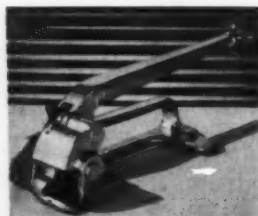
... for more details, circle No. 311

LOW-FUMING GAS FILLER ROD ... welds bronzes and brasses

Welded high strength bronzes and brasses can be difficult—unless you're familiar with this new, low-fuming gas filler rod. The new rod, **AMPCO-BRAZ No. 4**, is produced from manganese bronze alloyed with nickel for higher tensile strength, better ductility and greater toughness than that obtained with regular low-fuming bronze filler rods. It meets AWS-ASTM classification R-Cu Zn-B and Federal Specification QQ-R-571a, Class FS-R Cu Zn-3. The new rod also performs well when used to repair and build up bearing surfaces on steel, cast iron and malleable iron, and can be used to repair gear teeth, pistons and cams and finds application in many corrosive media. **AMPCO-BRAZ No. 4** is readily applied in all positions using regular gas brazing and braze-welding techniques and fluxes. **Ampco Metal, Inc.**

... for more details, circle No. 312

STEEL STRAPPING TOOL ... use in any position

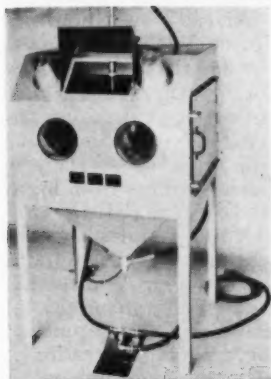


Ease of handling is the key to the success of this versatile unlimited take-up steel strapping tool. It not only reduces fatigue, but it may be operated in any position and will strap in any direction... using the right or left hand. Applying seals to the rear of the tensioning wheel cuts overlap to minimum required for maximum joint security. The tightening action is more positive because there are two holding pawls instead of one on the tensioning wheel, and the tool is removed quickly by simply returning the tightening lever to its down position and sliding the tool from the strapping. Two models of this tool are available; the "OL" (light duty) and "OM" (medium duty) for light and medium strappings. **Stanley Steel Strapping, division of The Stanley Works.**

... for more details, circle No. 313

SAND BLASTING CABINET

... allows use of both hands



Want to allow your operator free use of both hands when holding objects to be sandblasted? There's a double-duty blasting cabinet which features two independent ceramic nozzled blast guns, which might help. One gun is mounted vertically through the top of the cabinet and controlled by a quick height adjustment. This fixed gun allows free use of both hands during

blasting. The other gun is a flexible trigger-operated hand unit especially useful for cleaning crevices and angles as well as heavy objects. The cabinet of the unit features a perforated-steel floor to screen the abrasive prior to automatic recycling. The Cyclone Sandblast Equipment Co.

... for more details, circle No. 314

INDIVIDUAL LINK CHAIN STYLES

... feature heat transfer, abrasion properties

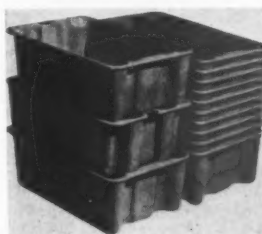
Heat transfer properties and high resistance to abrasion are featured in this chain which comes in three individual chain link styles and two distinct types of material. Proof Coil, B.B.B. or Passing Link style can be used to make up the entire loop or

curtain chain system. However, where certain production difficulties have been encountered or specific results desired lengths of these link styles can be alternated. All three styles are available in either straight carbon or new Thermal-Abrasive Resistant steel. Fittings and accessories can be supplied to the same physical specs as the chain desired. Straight Carbon Steel Kiln chain is best fitted for the cooler end of the chain section and can be carburized to increase its wear resistance properties. Thermal-Abrasive Resistant Kiln chain No. 7 has been developed especially for the hot end of the chain section, with high resistance to abrasion and high temperatures. It can increase the normal life of the hot-end of a chain by as much as 100%. The Campbell Chain Co.

... for more details, circle No. 315

NEW SIZE STACK-n-NEST TOTE PANS

... 22 x 17 x 10 in.



A new size, 22 x 17 x 10-in., has been added to the Lewis line of Stack-n-Nest tote pans, which now consists of the following sizes: 16 x 10 x 5-in., 18 x 12 x 6-in., 18 x 12 x 8-in., 22 x 14 x 8-in., 22 x 17 x 10-in., 27 x 16 x 11-in., 34 x 24 x 19-in.,

and 39 x 19 x 14-in. Also available are fiberglass covers and dollies to fit the 22 x 14 x 8-in. and 27 x 16 x 11-in. sizes. G. B. Lewis.

... for more details, circle No. 316

PROTECT your outdoor storage

POLYETHYLENE FILM

Low prices on this tough weather-proof film.

Available in rolls up to 100 feet long by 32 feet wide.

WEST'S LARGEST PLASTIC STOCKS

RODS SHEETS TUBES

- PLEXIGLAS
- STYRENE
- PHENOLICS
- FIBERGLAS
- VINYLITE
- MYLAR
- TEFLON
- ACRYLIC
- NYLON
- POLYETHYLENE
- Kel-F
- ACETATE

West's Lowest Prices

CADILLAC PLASTIC COMPANY

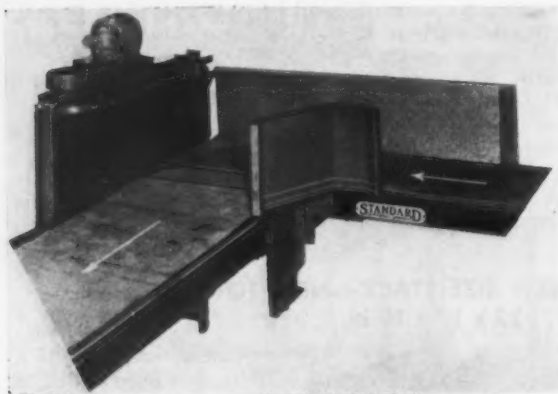
313 Corey Way
So. San Francisco, Calif.

2305 W. Beverly Blvd.
Los Angeles 57, Calif.

... for more details, circle No. 38 on Reader Service Postcard

RIGHT ANGLE TRANSFER UNIT ... diverts various size commodities

Here's a low cost, compact and efficient right angle transfer unit for diverting various sizes and types of commodities. The unit consists of a feed



and takeaway belt set at right angles to each other, with a short vertical belt mounted across the end at a right angle to the feed belt and parallel to the take-away belt. It's the vertical belt which assists in turning the commodity and in making the transfer complete. Each belt is separately driven to eliminate complicated drive arrangements and costly maintenance problems. **Standard Conveyor Co.**

... for more details, circle No. 317

TELESCOPIC COUNTERWEIGHT ... increases truck lifting capacity



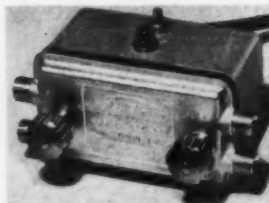
Load capacity on a small model lift truck has been increased 1000 lb. by use of a telescopic counterweight that increases lifting capacity without increasing the weight of the truck. The counterweight, attached to two

steel shafts which slide in and out of the rear end of the truck, is fully adjustable and may be extended any dimension out to 24-in. from its normal position.

The counterweight is hydraulically operated with the control lever conveniently located for the driver. **Champ Corp.**

... for more details, circle No. 318

GAS CONTROL UNIT ... cuts welding costs



At last—a pushbutton device which regulates the flow of oxygen and fuel gas in welding and cutting operations. A touch of the button automatically switches flame settings from high to low, enabling the torch operator to obtain fast cutting starts as well as rapid reduction in preheat flames to maintain and improve the cut once it is started. As a bonus you get faster starts, reduced gas consumption, better quality finish, and less wear on equipment. Equally efficient in hand or machine operations, the gas saving valve is ideal for brazing and heating, silver soldering, welding operations, heat treating or flame hardening. And it has a capacity for normal operation of up to eight machine cutting torches. It can be used with standard 3-hose cutting equipment—and with welding torches of medium or high pressure type—without accessories. **Smith Welding Equipment Corp.**

... for more details, circle No. 319

LEADED STEEL TUBING ... first available from warehouse stocks

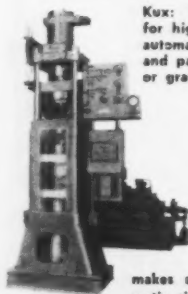


The first leaded steel tubing to be made available from warehouse stocks is known as Ledloy 170, and is a cold drawn seamless steel tubing of low carbon analysis with .15 to .35% lead added. The high rate of machinability of Ledloy 170 steel tubing was demonstrated at the

1958 National Metal Show in Cleveland where parts were produced from it at surface cutting speeds about 50% faster than the speed employed with non-leaded steel tubing of comparable analysis. The company said that a minimum increase of 25% in the productivity of machined parts and components could be expected when using Ledloy 170 tubing in place of non-leaded tubing. **Joseph T. Ryerson & Son, Inc.**

... for more details, circle No. 320

KUX TABLET PRESSES

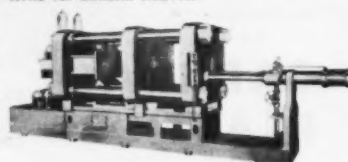


Kux: The accepted standard for high-speed production and automatic forming of tablets and parts from dry, powdered or granulated materials. Single and multiple punch models, mechanically or hydraulically operated. Sizes: from 50 to 600 tons pressing capacity! Rigid! Rugged! Constructed to meet most severe demands for service. Kux also makes special presses for automatic sizing or coining. Ask for

Bulletin #FM4100-591.

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Complete line from 50 tons to 2000 tons locking pressure air or hydraulic operated machines for lead, zinc, tin, aluminum, magnesium, brass die casting. A size and model for every need. All machines strain bar tested and registered. Simple, Safe to operate, Economical in cost and upkeep. Hydraulic units equipped with extra large oil reservoirs, oversize oil coolers, filters. Sizes: from 13" x 6" between tie bars to 60" x 60" with 2000 tons die locking pressure. Write for Bulletin FM591K.



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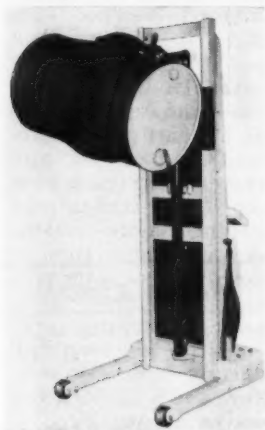
ZONE... STATE

... for more details, circle No. 39 on Reader Service Postcard

WESTERN INDUSTRY — January 1959

DRUM TILTER MACHINE

... hydraulically lifts, pours



It's now possible to hydraulically lift, move, and stack—and to pour from—heavy 1000-lb. drums by use of a drum tilter machine. Ideally suited for movement in and out of drum aisles—easy to push and position in close quarters—this lift truck permits tilting the drum to any desired degree and holding in that position any length of time. The drum tilter is ideal for solid drum stacking. The unit lifts hydraulically to a height of 130 in. and

pouring can be accurately controlled at all heights and at any degree from the ground level. Operation is completely safe for the user at all times. Shown is the model 5074 with a lifting height of 84 in. Other models are available in all lifting heights. The unit features a heavy duty industrial battery and a heavy duty, synchronized 12-volt system. Big Joe Mfg. Co. ... for more details, circle No. 321

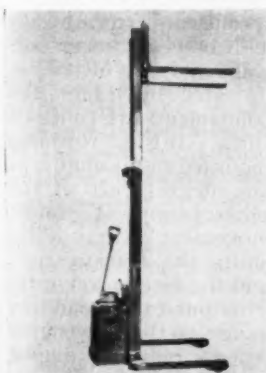
PORTABLE FOOT WARMER

... to aid production effort

Cold feet been slowing production line workers in your plant? Here's a solution. A portable foot warmer designed for use in production areas, the unit is called an Electro-Mat. This electrically heated, all neoprene rubber mat will also find wide use by warehouse workers and a variety of others whose job entails standing on cold floors or in drafty places. The mat is 14 x 21 in. and can be transferred easily from one place to another. Storage is easy and it's constructed for safety. More... it requires less electric power than a 100-watt light bulb, and will operate on either a-c. or d-c. The Electro-Mat retails for \$7.95. Interstate Rubber Products Corp. ... for more details, circle No. 322

24-VOLT WALKIE STACKER

... for 2,000-lb. palletized loads



This model handles loads up to 48 x 48 in. and will stack them more than 10 ft. high. The compact power unit consists of four six-v. batteries mounted in pairs on each side of the drive unit. The Walkie Stacker will enter pallets at right angles in aisles as narrow as 53 in., depending on pallet size. All controls for travel speed and direction, elevating and lowering

are conveniently clustered on the steering handle control head. Also mounted on the handle head is a mushroom safety button. The Raymond Corp. ... for more details, circle No. 323

UNSIGHTLY SALT-STAINED BRICK?



Eliminate efflorescence for life with one inexpensive application of WATCO Masonry Preserver

Try the "wire brush test" on any brick wall—before and after sealing pores permanently with Watco. No more dusting—no spalling—of brick or mortar! 25 years experience proves this special oil-and-resin compound of over 60% solids content will penetrate into and become a resilient permanent integral part of porous brick and mortar. Not a mere surface film or coating—Watco solidifies within the pores and binds all particles. Permanently prevents dusting and deterioration.

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... for more details, circle No. 40 on Reader Service Postcard



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INDUSTRIAL GLOVES

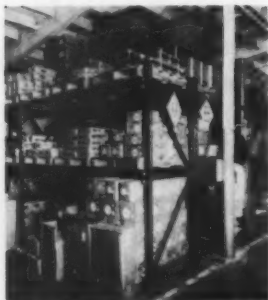
What a combination to beat the high cost of safety and service. Turn-Cuffs keep dangerous liquids away from arms and inside of gloves and Sureseal withstands more chemicals, oils, acids and solvents than any material we know. Top jobbers stock them or we will arrange a use test at our expense—write today.

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... for more details, circle No. 42 on Reader Service Postcard

FLEXIBLE STORAGE SYSTEM

... permits three 40x32-in. pallets per bay

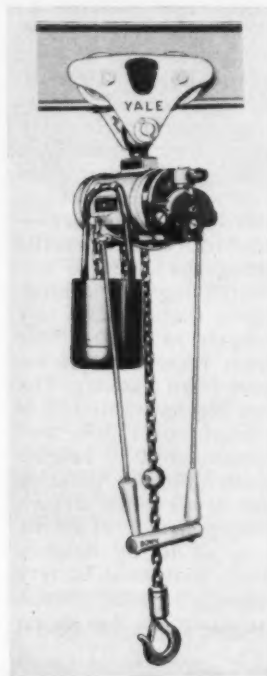


One flexible storage system—stocking over a million pounds of material—accommodates the complex inventory stored at the Los Angeles Drug Co.'s Anaheim warehouse in Southern California. Workmen put up 486 bays of the easy-to-erect storage system in just 24 man-hours. Racks—

designed and manufactured by Sturdi-Bilt—consist of three basic components: vertical end frames, horizontal support bars and floating wedges to lock them together. Slots spaced three in. on centers in the end frames permit almost limitless shelf height adjustment. Los Angeles Drug stacks its racks in two-bay rows 18 ft long, 9 ft. high and 30 in. deep. This arrangement permits three 40x32-in. pallets per bay. When materials do not call for palletizing, warehousemen convert to bulk storage merely by placing ordinary dunnage across the recessed horizontal support bars. Number of shelves varies from three to four per rack—depending upon size and shape of stock. Shelves carry up to 4,000 lb. each, but average about 1,000 lb. Total amount of material stored in entire system varies from day to day, but is often close to 1,000,000 lb. Seven tons of stock usually flow through the system each day. Sturdi-Bilt Co.

AIR POWERED HOISTS

... for close load spotting

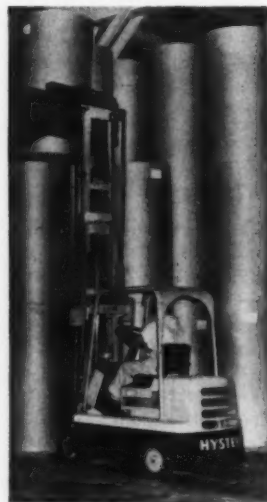


Air powered hoists are essential where close load spotting, carefully controlled lowering speeds and variable hoisting are part of your production pattern, and where the presence of explosive atmospheres presents safety hazards with electric motors, or corrosive or unusually dirty conditions would create maintenance problems with less simplified hoisting mechanisms. Now, a new air hoist line has been introduced in link chain and roller chain models of 1000- and 2000-lb. capacity, in both hook and trolley types. Load spotting and variable speeds are controlled by choice of push button pendant or pull cable control. Standard lifting speeds, utilizing 90 lb. per sq. in. of air pressure, range from 6 to 40 ft. per min. in the 1,000-lb. model under full load and 3 to 20 ft. per min. with the 2,000-lb. model with full load. An external adjustment screw on the hoist permits a wide variance of lowering speeds to suit any application. Yale & Towne Mfg. Co.

... for more details, circle No. 324

TWO-SPEED POWER SHIFT

... optional for new lift-trucks

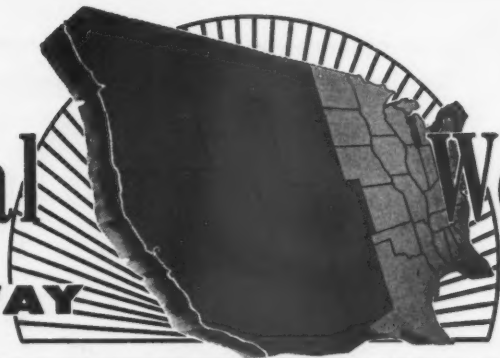


A two-speed, power-shifted transmission is now being offered as optional equipment for a new range of pneumatic-tire lift trucks in the 6000-8000 lb. capacity range. It is a constant mesh unit with integral torque converter, and has a two-speed range forward and two in reverse operated by levers. All components are confined in a single housing mounted to the engine as an integral part of the power train. A simple movement hydraulically shifts the transmission, and the torque converter automatically adjusts power output to fit road and load conditions within each range, so that the engine runs at its most efficient speed, reducing engine wear and prolonging engine life. Action of the torque converter also absorbs shock loads on shafts, bearings, gears and axles, while extending truck life. The Hyster Co.

... for more details, circle No. 325

The Industrial West

ON ITS WAY



plants • production • distribution • personnel

What's Going On...

Like champagne corks on New Year's Eve, the West is celebrating the start of 1959 with new plants and expansions popping up all over the place... as reported from Phoenix, Southern California, Seattle, etc.—on this page—and, further on, from other key cities in the West.

New contracts add more sparkle to the industrial picture, as you'll see on page 90... while that barometer of activity—steel—is rising, with expansions and construction of steel warehouses covered on that page and on page 93. You'll find other news of steel on pages—88 and 98.

A first-of-its-kind material handling show in the Northwest... a \$14,000,000 cement plant slated for Arizona... a chance to see the Reliance R-Cade... a visit from Japanese industrialists... and personnel items from throughout the West are other news notes we've collected for you.

M. C. Tracy
WI News Editor

Stromberg-Carlson Expands Facilities in San Diego

SAN DIEGO—With the start of construction in mid-December, Stromberg Carlson-San Diego began its second major expansion of engineering and manufacturing facilities within a year. The 15,750-sq. ft. structure, adjacent to the present Electronic Systems plant at 1895 Hancock St., is scheduled for completion in March.

A division of General Dynamics Corp., the firm is expanding because of increased activities in the computer readout and display equipment field.

Present plans call for a 43% increase in the systems plant, bringing the total San Diego facility to 71,000 sq. ft. The firm's tube plant is at 3235 Hancock St.

New Plant in Northwest

WALLA WALLA, WASH. — The Strammit Corp. plans to build an insulation board plant here. The facility will be located near the city-county airport and will use wheat straw as production material.

Denver Electrical Exhibit Set for April 24-25

DENVER — The Rocky Mountain Electrical Manufacturers Representatives Club, Inc., will sponsor the second annual Denver Electrical Exhibit April 24-25. One hundred exhibit spaces will be available at the show in the Tower Merchandise Mart. Details are available from James Wall, chairman, RMEMR Club, Inc., 1441 Welton St., Denver.

Glass Products Plant Scheduled in Seattle

SEATTLE—First unit of a \$250,000 glass products manufacturing plant is now under construction by Penberthy Instruments Co. at 6701 S. Maynard. The initial \$80,000 building will have 10,000 sq. ft. for production of radiation-shielding glasses.

Penberthy manufactures glass products primarily for the atomic energy and electronic industries and since 1949 has been engaged in development of dense lead glass.

The new facility will have some \$30,000 worth of new equipment including that for batch-mixing, plus annealing ovens, new furnaces and a grinding and polishing line. The firm expects to double its present work force of 50 in 1959.

Present offices of Penberthy will remain at 4301 Sixth Ave., where research and development will be conducted.

3 Western States Lead In Manufacturing Growth

SALT LAKE CITY—According to the U. S. Department of Commerce, three Western states—Nevada, New Mexico and Utah—are leading the nation in growth of manufacturing industries during the post-war years.

The report, in the Area Development Bulletin, uses the per cent increase in the dollar amount of "value added by manufacturing" as its yardstick of growth.

In Utah the major increase occurred in manufacture of petroleum and coal products; stone, clay and glass, products, and in non-electrical machinery.

Three New Industries Slated for Phoenix Area

PHOENIX — Latest industrial developments for the Phoenix area include the location of a fertilizer factory, an oxygen plant and a rolling steel mill that is being moved here from San Jose, Calif.

The fertilizer facility will be a \$4,000,000 plant that Southwestern Agrochemicals, Inc., will build next to a small facility the company has been operating at Chandler. Capacity of the plant will be about 21,000 tons annually of dry anhydrous ammonia.

The oxygen plant is being built on a five-acre site at 3332 W. McDowell Road by The Dye Oxygen Co. Products will be liquid oxygen, nitrogen and argon for industrial and medical use. New equipment for the facility includes a \$200,000 compressor of 1,000 horsepower.

Production at the relocated steel mill is scheduled to begin by the end of January, according to officials of Western Rolling Mills, a division of California's Yuba Consolidated Industries. The facility will be located on a 140-acre site south of Tempe, Ariz. Its initial products will be small circular reinforcing bars for concrete building foundations, cast from scrap steel melted in an electric furnace. More complex products are planned later.

Waste King Enlarges Technical Products Division

LOS ANGELES—Waste King Corp. has expanded its Technical Products Division facilities with a leasing of a new 30,000-sq. ft. headquarters building at 5550 Harbor Ave. The 18,000-sq. ft. production portion of the building will accommodate testing facilities for precision instruments, a precision machine shop and an assembly area.

Products of the division include mechanical components and assemblies for aircraft, guided missiles and other ordnance, precision-machined experimental rocket and missile parts, and complex systems assemblies. It manufactured the gyro stabilizer system used in the Jupiter-C rocket.

The division's Valley Air plant is at 13700 Saticoy Ave., Van Nuys, and its BBB facilities at 4901 District Blvd., Los Angeles.

Engineers Tour New SPS Facility

SANTA ANA, CALIF.—Standard Pressed Steel Company's new, multi-product 280,000-sq. ft. Western Division manufacturing facility was the scene of a recent plant tour sponsored by the Los Angeles Chapter, Standards Engineers Society. Following dinner at the Disneyland Hotel, guests were shown the many facets of precision fastener manufacturing.

Here Jack Sherman, SPS Western plant manager (extreme left) explains a large precision industrial fastener—cold-formed on one of the largest cold-header machines in operation in the West—to Austin Daigle, Autonetics; Bud Bramblett, Rocketdyne; N. H. Pease and A. W. Purcell, Hughes Aircraft; Art Chippendale, Convair-Pomona; F. Kent Gill, North American; D. H. Martin, Ramo-Wooldridge; Jim Humphries and V. DeSalvatore, SPS Western.



New Hughes Unit Starts Production This Month

FULLERTON, CALIF.—Scheduled to start production this month is the 302,000-sq. ft. plant Hughes Aircraft Co. has been building for its Ground Systems Group. The \$6,000,000 facility in the West Coyote Hills at N. Gilbert Ave. will have 90% of its work in military contracts.

Designed mainly for research and engineering, the facility has an administration office section, a two-story basic use section and a huge single-room laboratory and assembly area, plus a 15,000-sq. ft., 450-person cafeteria.

A communications center with 2200 incoming and internal lines; radar test sites, and a radar test equipment facility are included at the plant. A 100,000-sq. ft. fabrication plant for steel cabinets that house radar equipment is located nearby.

Hughes now has more than 600,000 sq. ft. of plant area here, with about half of it leased for engineering and research on radar devices and data processing systems.

Garbe Mfg. to Build Plant in La Habra, Calif.

LA HABRA, CALIF.—Garbe Manufacturing Co. will build a 28,880-sq. ft. plant on Leslie St., north of Imperial Highway here, that will be used primarily for metal stamping operations. Completion of the plant is scheduled for April, when the firm will move its operation from present quarters in Huntington Park.

Linde Sponsors Seminar for Safety Engineers

SAN FRANCISCO — Current safety practices for equipment and processes in the welding industry were studied at a recent all-day seminar sponsored for safety engineers of the California Division of Industrial Safety by Linde Co., Division of Union Carbide Corp.

Ed Brubaker, senior engineer, and 10 others attended the sessions in the Union Carbide Building, 22 Battery St.

Lee Reay, Linde Pacific region merchandising specialist, and C. R. Strock, assistant manager of electric welding, conducted the seminar which dealt with safe practices in manufacture, transport and use of industrial gases such as oxygen, nitrogen and argon in both liquid and gaseous form.

Proper use of welding and cutting apparatus was demonstrated and requirements for protective clothing, ventilation and eye protection were outlined.

Arizona May Get Salt Water Conversion Facility

SAFFORD, ARIZ.—A plant for research into conversion of sea water into fresh water may be located in this area, reports indicate. Congress has authorized—but not appropriated funds for—five such facilities, one of which may be situated at the University of Arizona's experimental farm east of here, where attempts are being made to grow crops with pumped water that is more than 4,000 parts per 1,000,000 in salt.

Over 1,000 Attend M-H Equipment Show in Seattle

SEATTLE—More than 1000 persons attended the recent Materials Handling Equipment show, first of its kind to be held in the Northwest. Staged at the local showroom of Air-Mac, Inc., the show occupied more than 35,000 sq. ft. of floor space and offered the largest, most complete array of materials handling equipment assembled under one roof in this area.

The show featured actual models, cut-away sections and working displays of over 400 pieces of equipment, representing 60 manufacturers.

Among some of the products seen in the Northwest for the first time was Towmotor's Towmastatic Drive hydraulically operated lift truck, which introduces a new concept of pedal-controlled power transmission.

Other highlights were the new Raymond electric four-directional lift truck and a working display of Rapids-Standard's overhead conveyor system, including power belt and gravity systems. Other exhibits included hoists, warehouse racks, industrial sweepers and vacuum cleaners, elevating tables and special containers.

Because of the response from firms and industries in the area, plans are being made to make the show an annual event.

Brown Trailer Opens California Facilities

OAKLAND, CALIF.—Brown Trailer Division of Clark Equipment Co. has opened California sales and service headquarters at 8855 San Leandro St., where the division has woodworking and paint shops and a paved lot for display of used trailers.

Carl L. Hoehner is branch manager for the division which deals in heavy duty trailers used in the trucking and construction industries. A branch facility at Fresno and sales offices at Los Angeles and West Sacramento are also under his direction.

The Los Angeles location is at 2185 E. 7th St., and the Fresno one at 2544 S. Cherry Ave.

Gate City Steel, Denver Buys Albany, Calif., Firm

DENVER—Gate City Steel, Inc., has purchased the Moffett Engineering, Inc., crane designers and builders of Albany, Calif., according to N. R. Knox, president. The Moffett firm will be operated as a wholly owned subsidiary of Gate City Steel.

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WESTERN INDUSTRY—January 1959

Fabricated Steel Service Offers Special Tubing Sizes

NORTH HOLLYWOOD, CALIF.—Sizes of square and rectangular structural steel tubing not usually stocked by Western tubing distributors or produced by steel tube mills will be specialized in by the Tubular Division, recently-formed unit of Fabricated Steel Service, Inc., 7400 Laurel Canyon Blvd.

Tubing will be sold through Western steel service centers and to mill buyers, according to *Edwin M. Waite*, vice president and general manager.

These products, which permit installation of wiring and plumbing in the tubing when used as columns, are finding increased use among architects and structural engineers, as well as by manufacturers of heavy machinery, aircraft and missiles, who use the special size tubing for varied structural applications.

According to the firm, it is the first in the West to produce a wide range of sizes, wall thicknesses, finishes and analyses. The facility also affords the benefit of short production runs and prompt delivery. Tubing is made by press forming steel, and welding it with fully automatic submerged arc equipment.

Engineering data and product information can be obtained from the manufacturer.

General Conveyor Appointed by Jeffrey in Utah, Arizona

SALT LAKE CITY — Jeffrey Manufacturing Co., Industrial Division, of Columbus, O., has appointed General Conveyor, Inc. of Utah, and General Conveyor, Inc. of Arizona as its manufacturer's representatives for the Intermountain states of Utah, Arizona, Nevada, Idaho and Western Montana.

The Utah firm is located at 15 N. W. Temple St., here, where the phone number is DAvis 8-0387. The Arizona company is at 478 N. Scottsdale Rd., Scottsdale, with the phone number WHITney 5-7998.

W. L. Lippert is manager of the Utah branch and *O. L. Underwood* of the Arizona unit.

Zila Manufacturing Co. To Have New Gardena Plant

LOS ANGELES—A new plant for Zila Manufacturing Corp., manufacturer of screw machine products and plumbing specialties, is under construction at 16201 S. Broadway, Gardena. Occupancy for the new facility is scheduled for February 1. The new quarters will provide 19,500 sq. ft. of plant and office space, plus large parking area.

Zila is presently located at 9610 Bellanca, Aviation District, Los Angeles, where the building is being leased to Ramo-Wooldridge Corp.

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... for more details, circle No. 46 on Reader Service Postcard

Comstock Steel Opens Sacramento Service Center

SACRAMENTO, CALIF.—Comstock Steel of Sacramento, Inc., has opened a \$200,000 steel service center at 8590 Fruitridge Road to serve Central California and Nevada mining, farming and manufacturing needs.

The 20,800-sq. ft warehouse facility has 70 feet of its storage area under a five-ton capacity overhead crane. Storage racks and handling equipment were designed by Frank Cassina, plant superintendent, and fabricated in the firm's previous location at 909 Soule St. The warehouse is located on a 20-acre site and is served by a railroad spur track.

Affiliated with Comstock Steel Co. of Phoenix and Tucson, Ariz., the Sacramento firm's products include carbon grade bars, sheets and structurals, as well as hot rolled plate, pipe and cold finished carbon bars.

Manager of the company here is David F. Gotthardt, former branch manager of United States Steel Supply Division in Portland.

Automatic Tube Sets Up Western Unit in San Jose

SAN JOSE, CALIF.—Establishment of a Western headquarters for Automatic Tube Co. of Chicago at 1365 N. 10th St., was announced recently. The firm makes pneumatic devices used to carry papers and small items in stores and factories.

Initial plans call for a 5,000-sq. ft. building, to be expanded later, company officials said.

Power Tools on Display



DURING THE 5TH Annual Auto Trim Show held in Los Angeles recently, Milwaukee Electric Tool Corp. exhibited a completed line of power tools. On hand at that booth to demonstrate electric drills, grinders, hammers, screwdrivers and sanders were, left to right, Walt Sibula, Dale Nichol and Al Laurila, branch manager.

\$14,000,000 Cement Plant Scheduled in Arizona

CLARKDALE, ARIZ.—Plans for construction of a \$14,000,000 "dust-less" cement plant here have been announced by the Riverside Arizona Cement Co. Dust-collection equipment for the facility will cost \$325,000. The plant will use natural gas as fuel, with smoke strained through bag houses near the kilns. Sprays in the crusher department and 17 collection units to draw air through a water spray will be used to prevent dust discharge.

Monsanto to Make Mersize at Seattle Facility

SEATTLE—Facilities for production of mersize, a fortified rosin size that gives water resistance to paper and paper board, are planned by Monsanto Chemical Co. at its installation here. Construction has begun on the plant with start of operations scheduled early this year.

Monsanto also makes the product in Georgia and Canada and has bulk storage facilities for mersize here. The company will ship rosin to the local plant for processing into paste mersize for the Western paper industry.

Hamerslag, M-H Distributor, Buys Site for Expansion

SOUTH SAN FRANCISCO—Expansion plans of Hamerslag Equipment Co., material handling equipment distributor and sales engineering firm, were revealed with the announcement the firm had purchased a half-acre plant site in the Utah Construction Company's industrial park here.

According to Jay Platt Hamerslag, Jr., president and general manager, cost of the plant and site will be more than \$100,000. Construction plans are to be completed soon, with a move to the new facilities by the end of 1959. Hamerslag is presently located at 110 Freeway Blvd., here.

Steadily increasing sales and services of the firm made the expansion necessary, said Hamerslag.

New Contracts Boost Western Industry

LOS ANGELES—A \$50,000,000 contract negotiated by the Air Force and the Northrop Division of Northrop Aircraft, covering production of more Snark SM-62 intercontinental guided missiles, highlights the news of contracts recently reported by Western firms and military establishments. The order includes a \$20,000,000 letter contract awarded in September.

The U. S. Army Ordnance Los Angeles district, in Pasadena, has announced the award of \$2,000,000 in contracts to the following firms:

Gilfillan Brothers, Inc., Los Angeles, a \$493,743 contract for Corporal missile repair parts; a \$120,620 contract for technical publications; and a \$104,302 contract for engineering services.

California Institute of Technology, Pasadena, \$586,760 in contracts for research and development work to be performed at the Jet Propulsion Laboratory, Pasadena; JPL Goldstone Test Facility, Camp Irwin, Calif.; and at Caltech.

The Firestone Tire & Rubber Co., Los Angeles, a \$163,564 contract for Corporal missile repair parts.

Douglas Aircraft Co., Inc., Santa Monica, contracts in the sum of \$99,

597 for Nike missile repair parts and launching area items.

Electronic Engineering Company of California, Santa Ana, a \$80,822 research contract for electrical wave shape investigation.

Northrop Aircraft, Inc., Hawthorne, a \$48,960 R&D contract, and Harvey Aluminum, Inc., Torrance, a \$38,829 contract for production engineering.

Other contract news involves—Motorola's Arizona division, recipient of a \$1,086,600 contract for developing an improved guidance system for the Navy's Sidewinder missile, with major work to be done at the company's Western Military Electronics Center in Phoenix.

Northrop Aircraft, which received its first production order for T-38 supersonic trainer aircraft, a \$16,926,000 contract announced by Air Material Command.

Gladden Products Corp., which has a one-year contract from Convair-Astronautics Division, General Dynamics Corp., for engineering and design work on missile hydraulic and pneumatic systems. Contract is estimated at \$500,000.

Telecomputing Corp., recipient of a \$2,861,828 Army Ordnance contract

for data processing services at the Alamogordo, N. M., White Sands missile range.

Ling Electronics, Inc., which was awarded a \$300,000 contract by Raytheon Mfg. Co. for high-power sonar transmitting equipment for the Navy.

Blaine Electronics, which has received a contract from North American Aviation for a parabolic reflector, antenna tower and accessory equipment.

North American Aviation's Missile Division, which received the initial production contract for the GAM-77 air-to-surface missile to be used with the Boeing B-52G missile platform bomber. Order is for \$18,928,000.

Summers Gyroscope Co., recipient of a \$1,500,000 contract from Beech Aircraft for flight control systems.

Gladding, McBean & Co., which has a \$215,000 Air Force contract for developing a missile nose cone; and G. M. Giannini & Co., a \$200,000 contract from the Air Force for angle of attack sensors.

The following firms also have been awarded ordnance contracts recently: Townsend Engineered Products, Inc.; Electro-Optical Systems, Inc.; and Utility Metal Products.

Lockheed Aircraft Plans Advanced Research Center

BURBANK — Construction plans for a multi-million dollar advanced research center have been announced by Lockheed Aircraft Corp., following purchase of a 198-acre bowl-shaped site for the scientific project. The facility will be located near Saugus, Calif., in Rye Canyon.

Initial building for the project, to be called Lockheed Research Center, is scheduled to start early this year. First step will be construction of a \$5,000,000 supersonic wind tunnel and high-altitude environment testing facilities in which complete aircraft can be submitted to simulated conditions of up to 150,000 ft. above the earth. A smaller altitude chamber simulating 500,000 ft. altitudes is also planned.

In the planning stages for the last three years, the center will explore problems of flight up to 10 times the speed of sound and at as yet unreached altitudes. Research will touch practically all aviation and transportation aspects, company officials said.

Westinghouse Will Export Aerojet-General Reactors

SAN RAMON, CALIF.—Westinghouse Electric Corp. announced its world-wide organization will market a complete line of research, training and educational nuclear reactors made by Aerojet-General Nucleonics. The two firms have signed a distributor agreement covering all of Aerojet-General's reactor models, ranging from the smallest "subcritical" to a unit with 10,000 kw. thermal output.

The equipment will be sold to universities and medical industrial research centers in foreign markets.

Ungar Tools Selects Bowen Co. as Denver Rep

DENVER—Ungar Electric Tools, Inc., of Los Angeles, has appointed R. G. Bowen Co., Inc., 721 S. Broadway, as Rocky Mountain area representative for its line of soldering tools.

Ungar products include pencil and pistol type soldering irons, de-soldering tools, and interchangeable tips and min-tips, effective in printed circuit work, in industrial production line soldering and electronic service repair.

Calpacific to Distribute Flodar Line of Fittings

SAN FRANCISCO — The Flodar Corp., Cleveland, O., manufacturer of tube and pipe fittings has appointed Calpacific Equipment Co., 50 Hawthorne St., as exclusive distributor in northern and central California and western Nevada.

Calpacific, specialists in sale of engineered industrial products including hy-

draulic equipment and devices, will assign three sales engineers to the Flodar products. Stocks of popular fittings will be maintained in the Calpacific warehouse here.

U. S. Chemical Milling Adds Machine Milling Service

LOS ANGELES—United States Chemical Milling Corp., Manhattan Beach, Calif., is adding machine milling services to its services, the firm has announced. The company recently acquired a division of Clemco Aero Products, Inc., of Compton, Calif., including milling machinery worth \$1 to \$2 million.

Western Gear Adds to Belmont Facilities

BELMONT, CALIF.—A February completion date is planned for Western Gear Corp. for new office facilities at its industrial products division here. The expansion project, which will provide 10,000 sq. ft. for sales, engineering and other activities, will cost some \$150,000.

Earlier this year the manufacturing facilities of the division were expanded on the 15-acre Belmont site. Products of the division, formerly located in San Francisco, include ordnance equipment, deck machinery, gear motors and speed reducers, steel industry equipment and other special machinery.



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UNIT WITH
SUMP COVER
DUPLEX,
DRY PIT &
HORIZONTAL
TYPES
AVAILABLE



DUPLEX
PACKAGE UNIT
AVAILABLE WITH 30,
45, OR 60 GALLON CAST
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NON-CLOG PUMPS

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WIDE RANGE OF SIZES AND TYPES conform to latest ASVHE recommendations, for vertical, elevated or floor level installation. ReturnZall package units (illustrated) are complete package units, with square cast-iron receiver, bronze fitted centrifugal pumps (type GR), standard heavy-duty NEMA motor and float controls. For complete information send for Series 1700 bulletins.

OTHER PACIFIC INDUSTRIAL PUMPS

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- Centrifugal pumps
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Through thick or thin... plastic or metal... "POP" Rivet is the answer. "POP" Rivets will not fracture plastic because it is held in compression. Best of all, "POP" Rivets are vibration proof... they can't shake out, back out or become loose... no lock washers or jam nuts are required.

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AIR POWERED TOOLS**

Whatever your needs, "POP" Rivet has the equipment. Both the hand and power tools are simple to operate. You can choose the type of gun that fits your budget as well as your needs.

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AND SERVICE CENTER**

The Universal Molding Company maintains a complete stock of "POP" Rivets and all types of "POP" Rivet Guns. In addition, Universal also offers the only "POP" Rivet service repair in the West.

*Trade Mark Mfg. by United Shoe Machinery Corp.

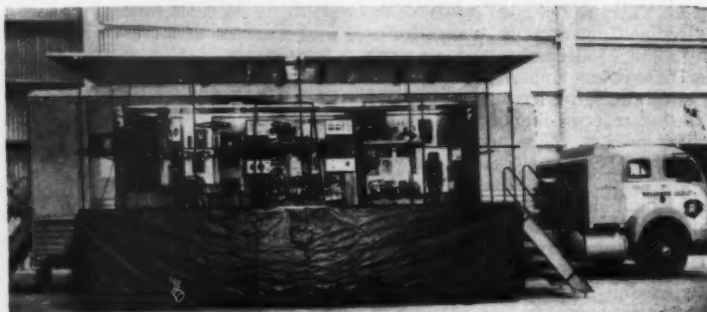
Universal

MOLDING COMPANY

10807 Stanford Avenue
Lynwood, Calif. Nevada 6-9721

... for more details, circle No. 48

Reliance R-Cade on Tour in West



THIS GIANT MOBILE DISPLAY, called the Reliance R-Cade, is touring the West to show business men, engineers and industrial production supervisors the variety of motors and drive products made by Reliance Electric and Engineering Co., Cleveland. The traveling display, housed in a special 32-foot trailer began its 50,000-mile, nationwide trip in Salt Lake City and during December appeared in Idaho and the Northwest. Itinerary for the R-Cade includes Sacramento, the Bay Area, Stockton, Southern California, Tucson and Denver in the next weeks. The mobile product show's display includes a-c. and d-c. motors, variable-voltage drives, mechanical variable-speed drive systems, gearmotors, motor control units and a demonstration of process control. Most of the equipment will be operating at each stop, including an automatic test stand drive complete with pressure regulation and volume regulation test problems.

**Public Warehouse Facility
Under Construction in LA**

LOS ANGELES — Ground-breaking ceremonies recently at 6277 E. Slauson Ave., marked the start of construction for a 102,000-sq. ft. concrete and steel public warehouse facility that the Zurich Warehouse Corp. of Switzerland is building.

The warehouse, on an eight-acre site, will include office space for Intramerican Warehouse Corp., an American firm owned by Willy P. Daetwyler, head of the Swiss corporation.

The warehouse operation will specialize in housing and handling of palletized merchandise, repacking and distribution for plant requirements. Facilities will include open yard storage, complete handling equipment and all types of domestic and foreign import warehousing.

The Intramerican California warehouse operation will be associated with the Lake River Terminal Corp. of Berwyn, Ill.

**Topp Sells Heli-Coil, Plans
Expansion of Other Units**

LOS ANGELES — Topp Industries, Inc., manufacturer of automated devices for industry, plans to expand its industrial controls division with proceeds from its recent sale of Heli-Coil Corporation, Danbury, Conn., subsidiary.

Topp also plans to finance the rapidly accelerating production of United States Semi-Conductor Corp., Inc., of Phoenix, Ariz., which the company is currently negotiating to purchase.

**Packard-Bell Starts Plans
For Electronics Park**

LOS ANGELES—Packard-Bell Electronics Corp. recently signed an option to buy

100 acres in Newbury Park, in a move which marks the beginning of an electronics park in the Conejo Valley of Ventura county.

The firm recently leased 62,000 sq. ft. of facilities, but will need further space, officials said. The initial phase of the planned park will include a 50,000-sq. ft. building to provide engineering and manufacturing space.

**IBM to Build New Punch
Card Plant in California**

SAN JOSE, CALIF. — International Business Machines Corporation has exercised options on a 20-acre site of land to be used as the location of a new punch card manufacturing plant, according to W. B. McWhirter, general manager of IBM's supplies division.

The new facility, which will supplant the present card manufacturing plant here, will be in Campbell, about eight miles southwest of San Jose. It will accommodate the division's card manufacturing and warehousing facilities, and be equipped with the most advanced card production and handling machinery.

Plans call for occupancy of the new plant by late 1959 or early in 1960.

Plant Site May Be Changed

LODI, CALIF.—A brick plant tentatively planned for construction here by Mexico Refractories now may be located in Sacramento county, where the firm has taken an option to buy a 50-acre site. Farmers in the area originally scheduled for the plant protested because they feared location of the plant would endanger crops.

Calbag Steel Warehouse Co. Completes New Facility

PORTLAND.—The new warehouse of Calbag Steel Warehouse Co. at 3441 N. W. Guam will contain the largest steel inventory in the Pacific Northwest, according to an announcement by the firm. With an additional 140,000 sq. ft. of floor space, Calbag has put in 7,000 tons of steel of all sizes and shapes to service fabricators and manufacturers throughout Oregon and much of Washington.

M. J. Rosenfeld, president, says he expects to increase this to nearly 11,000 tons within the next few months. He also stated he fully expects that industrial growth in Portland will cause the firm to expand again within three years.

Calbag recently conducted a plant tour for press representatives through the \$750,000 warehouse which was opened in mid-October. The firm will celebrate its 50th anniversary in 1959 and plans a series of open houses in that connection.

The company's scrap and non-ferrous operations will continue in present quarters at 2495 N.W. Nicolai St.

Kaman Nuclear Division Plans Colorado Lab Unit

COLORADO SPRINGS, COLO. — Kaman Aircraft Corp. of Bloomfield, Conn., has started construction of laboratories and offices for its nuclear research division on a 100-acre tract here. About 50 persons are expected to be employed initially, with an increase to 400 during the coming five years.

Kaman, which also has a branch at Albuquerque, N. M., manufactures helicopters. Its nuclear division deals with research and development in electronics.

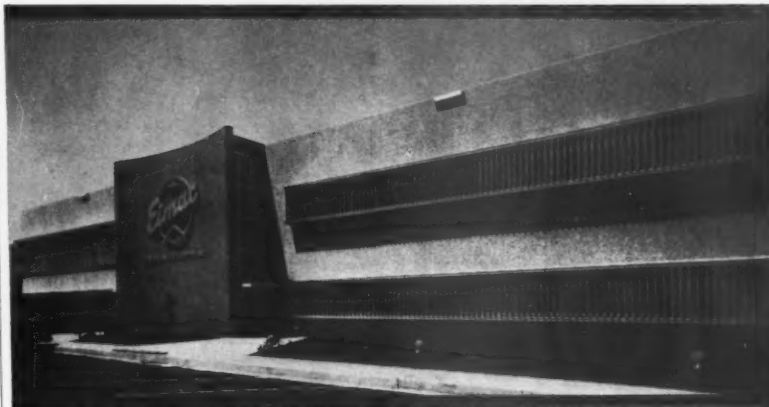
Cadillac Plastic Doubles Facilities in Bay Area

SAN FRANCISCO — Cadillac Plastic & Chemical Co. has more than doubled its warehouse and sales facilities here with completion of a new regional 8,000-sq. ft. distribution center at 313 Corey Way, South San Francisco.

Stocks complete enough to assure 24-hour service on most orders are now handled at the center, which is teletype-linked to the firm's warehouses in Los Angeles and eight other cities. Frank M. Hunt is manager of the branch, which serves more than 2,000 active accounts in the Bay area, Pacific Northwest and Central California.

Cadillac, one of the largest distributors of plastic sheets, rods, tubes and films in the West and in the nation, also has a warehouse and regional sales office at 2305 Beverly Blvd., Los Angeles. The firm has added an average of six new lines yearly since the San Francisco branch opened in 1955.

30 HILL TRANSFORMERS SERVE EIMAC'S NEW ELECTRONIC HEADQUARTERS



A \$2,000,000 plant as up-to-the-minute as the products it produces.
Electrical Contractor: Biber Electric Co., San Carlos, Calif.

Space-saving HILL wall units
conserve valuable manufacturing
space. They are 25 KVA—
Dry type—80° rise—1 phase—
60 cycle—480 volts to 120/240
volts—internally rubber mounted
for minimum noise level.



Eitel-McCullough, Inc., San Carlos, California, recently added its name to the rapidly growing list of modern industrial plants which have chosen HILL Transformers for dependable service.

Do you have a transformer problem...special design...exact-ing specifications...delivery deadlines? Join the increasing number of those who specify HILL craftsmanship. (NEMA and ASA standards of course.)

Power and distribution transformers—

OIL FILLED • ASKAREL • DRY TYPES
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Available through leading electrical wholesalers.

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L.A. AMHS Plays Host to Japanese



THE LOS ANGELES CHAPTER of the AMHS (American Material Handling Society) played host recently to 15 Japanese metalworking executives currently touring the U.S. to study quality control and better material handling methods. High spots in the intensive course in material handling methods were tours of Brunswick Drug Co., Topp Industries, and a full day at McCulloch Motors. The visitors were shown a 30-minute film on powered industrial trucks, and enjoyed a practical discussion of handling methods by **Robert Astle**, chief industrial engineer at McCulloch Motors, assisted by members of the AMHS board of directors. Pictured above are AMHS members and Japanese executives.

Triplex of American Purchases Ohio Firm

PUEBLO, COLO.—Triplex of America, Pueblo, has purchased controlling interest in Aluminum Industries, Inc., of Cincinnati, Ohio. *Alvin O. Herud*, presi-

dent of Triplex, will head the new subsidiary and will remain in Pueblo. Triplex operates its own smelter and foundry in Pueblo and manufactures aluminum pistons. The Cincinnati firm specializes in valves, cylinder sleeves, automotive and brake pistons and various aluminum castings.

Wahlgren Magnetics Established in Pasadena

PASADENA—Wahlgren Magnetics, 1060 N. Allen, is a division recently established by Wahlgren Electrical Manufacturing Co., to specialize in subminiaturization. The division also designs and manufactures custom-built wave filters, toroidal and magnetic components and lumped-constant delay lines in all sizes.

Wayne Brown, formerly president of the Pacific division of Burnell and Co., Inc., heads the new unit. The line will be represented by the G. S. Marshall Co., 2065 Huntington Drive, San Marino, Calif.

Carlson Plant Produces Plastic Underground Pipe

COMPTON, CALIF.—First Western plant to produce plastic sewer and underground pipe is that recently completed here by Carlson Products Corp., Aurora, O. Said to be the most modern plastic pipe plant in the West, the 35,000-sq. ft. facility is located at 350 E. Manville Road.

The new plant, which will supply a complete range of plastic pipe and fittings for this area, is part of the firm's nation-wide expansion program.

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FOR ALL INDUSTRIAL APPLICATIONS



26

TYPES & SIZES

WHEEL TYPES: Drop Center, Lug Base, Disc, Demountable.

WHEEL DIAMETERS: 21", 20", 18", 17", 16", 15", 12", 10", 8", 6".

BEARINGS: Tapered roller, straight roller or ball.

TIRES: Pneumatic or cushion—all standard sizes.

Available with or without tires.

Write for catalog.

GAR-BRO WHEEL COMPANY

Division of Garlinghouse Bros.

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West Emphasized in 1959 Expansion by Eutectic

FLUSHING, N. Y.—An investment of over \$1,000,000 to expand its research, development and technical service facilities next year has been announced by Eutectic Welding Alloys Corporation, international manufacturer of more than 150 different alloys, fluxes and chemicals aids used in welding.

According to Fred F. Roehll, vice president, Eutectic will open at least four new warehouse-service centers next year to add to the chain of 11 such centers now operating. One for the Pacific Northwest will be opened at Vancouver, B. C., and others are planned for the West in addition to those now providing service from Los Angeles, Phoenix and Berkeley.

The corporation's increase in its technical representative staff will be proportionately larger in the West, compared to all other regions, Eutectic officials said. This reflects the significant upsurge in demand from Western industry for the firm's low temperature welding alloys.

Eutectic maintains a staff of several hundred technical representatives in this country and Canada to introduce firms to the latest technical improvements and developments and to offer aid in the operation of their welding activities.

Utah Manufacturers' Group Selects New Directors

SALT LAKE CITY.—The Utah Manufacturers' Association recently named nine new directors. Elected for a three-year term were the following: John B. Cahoon, general superintendent Interstate Brick Co.; Royden G. Derrick, president, Western Steel Co.; Oscar A. Glaeser, vice president and general manager of Western Operations, United States Smelting, Refining and Mining Co.; Ernest F. Goodner, president, American Gilsonite Co.; F. Cooper Green, general manager, Utah Copper Division, Kennecott Copper Corp.; L. K. Irvine, manager, Utah Lumber Co., and Vermiculite Intermountain Inc., and J. Arthur Wood, president, Utah-Idaho Sugar Co., all of Salt Lake City; John Higginson, Brigham City, general manager, Utah Division, Thiokol Chemical Corp., and W. Rulon White, Ogden, president, W. R. White Co.

Capell Appointed Sales Rep for Hi-Spec Electronics

LOS ANGELES — Hi-Spec Electronics, 7328 Ethel Ave., North Hollywood, Calif. has appointed the Richard Capell Co., as its sales representative for Southern California and Arizona. The Capell firm, an electronic manufacturers' representative, is located at 2639 S. La-Cienega Blvd.

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Nationwide Sales Force—CF&I Industrial Wire Cloth salesmen are located in 38 key cities from coast to coast and in Canada.

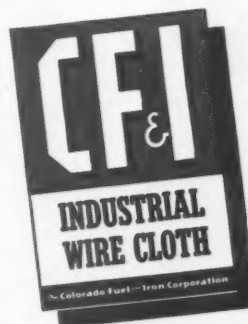
Experience—CF&I Sales Representatives are all thoroughly familiar with Industrial Wire Cloth, and can help you solve your problems by recommending the type of cloth that's right for your application.

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In the East: WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

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... for more details, circle No. 52 on Reader Service Postcard

Yuba Industries Buys Southwest Welding

SAN FRANCISCO—Purchase of Southwest Welding and Manufacturing Co., Alhambra, Calif., by Yuba Consolidated Industries, Inc., has been announced by presidents of the two firms.

The Alhambra firm, which also has a Richmond, Calif., plant, offers services for engineering, fabrication and construction of heavy equipment for atomic energy, petroleum, chemical, power and hydroelectric industries.

Active in fabrication and installation of large diameter pipe and penstocks, it is presently completing a \$7,500,000 installation at the Garrison Dam Project in North Dakota. Southwest also makes road construction equipment sold under the trade name "Southwest."

The firm will operate as a subsidiary of Yuba, with John Lucas, president, remaining active in management.

Rug Firm Expands

SAN LEANDRO, CALIF.—Expansion plans at Weartex Rug Co., 830 Castro St., call for an addition to its plant that will increase space to 16,250 sq. ft. The new building will be used as a warehouse with tentative plans for later use as a manufacturing facility.

Marine & Industrial Supply Named Lufkin Distributor

SEATTLE—Marine and Industrial Supply Company, 1123 W. Hanford St., has been appointed a distributor for Lufkin Foundry & Machine Co. throughout Washington, Northern Idaho, British Columbia and Alaska. The Seattle firm will stock a complete line of Lufkin industrial gears.

PG&E Plans Geothermal Steam-Electric Facility

SAN FRANCISCO—Pacific Gas and Electric Co. is asking permission from California Public Utilities Commission to build a geothermal steam-electric generating plant at the Geysers in Sonoma county. PG&E has reached an agreement with the Magna and Thermal power companies to deliver steam from wells they have developed to drive the turbine in a 125,000-kw. plant to be built by PG&E.

The utility firm expects to invest some \$2,000,000 in the plant and related facilities. Construction is tentatively scheduled for next July, and operation by April, 1960.

The Sonoma county plant will be the first of its type in North America, and the world's first privately-financed geothermal plant.

Borden Chemical Appoints Distributor for Resins

SANTA MONICA, CALIF.—Hastings Plastics, Inc., has been selected by the Borden Chemical Co. as exclusive California distributor for the line of polyfunctional epoxide resins recently developed by Borden's. Stocks of the five novolac-type liquid epoxy resins will be maintained in the Hastings warehouse here.

According to Ray Hanson, West Coast manager for the chemical firm, a division of Borden Co., three of the five resins provide fast curing systems for high temperature applications and adhesives and pre-impregnated laminates. The other two will result in cured products with greater chemical and water resistance and higher heat distortion temperatures.

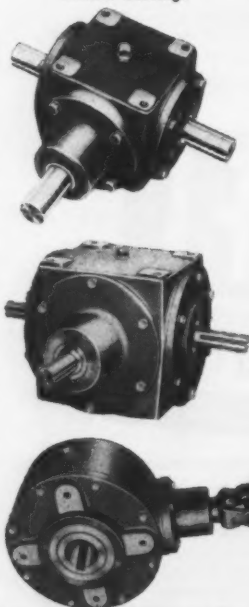
Jet Hangar Has Largest Plate Girder Steel Beams

SAN FRANCISCO—The maintenance hangar recently completed at the United Air Lines Jet Service Center here contains the largest plate girder steel beams ever used in a building. The seven 365-foot beams support the roof of the hangar which is 310 by 363 feet, and can accommodate four DC-8 jets and two DC-7 propeller planes at the same time.

HUB CITY

COMBINING QUALITY AND VERSATILITY

Stressproof Shafts
Timken Bearings



UNIVERSAL ANGLE GEAR BOXES

MODEL 66 STANDARD DUTY

Universal for rotation and mounting. Available gear ratios—1:1, 1½:1, 2:1. Available shaft sizes, 1¼" round or splined or smaller. Timken bearings and ground Stressproof shafts.

MODEL 88 HEAVY DUTY

Universal for rotation and mounting. Available gear ratios—1:1, 1½:1, 2:1, 3:1. Available shaft sizes, 1½" round or splined or smaller. Timken bearings and ground Stressproof shafts.

MODEL 99 EXTRA HEAVY DUTY

Helical ring gear type for extra heavy duty service. Choice of three ratios—40 to 6 tooth, 37 to 9 tooth, 34 to 7 tooth. Universal Joint supplied with choice of yokes in round, square or splined. Timken Bearings.

For complete information on these and other HUB CITY products ask your distributor, or contact Grether & Grether, Stockton, California or factory.

HUB CITY IRON CO. ABERDEEN, SO. DAKOTA

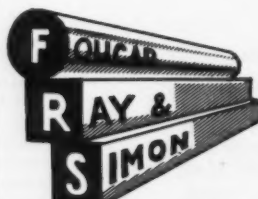
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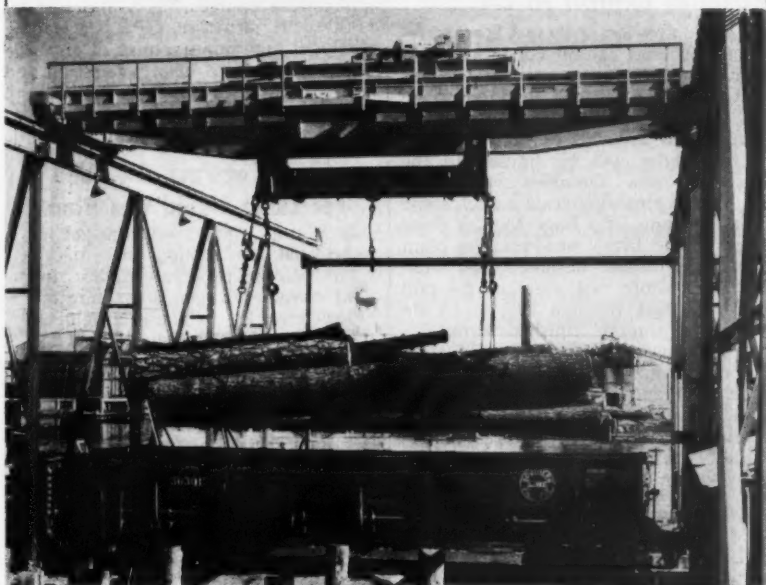


SAN FRANCISCO 7, CALIF.

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WESTERN INDUSTRY—January 1959

Log Hoist at Forest Products Center



THIS IS HOW logs are handled from rail to manufacturing at the new \$25,000,000 Diamond Gardner forest products center at Red Bluff, Calif. They are picked up by this 50-ton Ederer bridge crane. Chained loads are picked up as a unit and are scaled (to determine board footage) prior to dumping on the sorting apron.

Portland Firm Named Western Gear Distributor

PORTLAND — Power Transmission Products, 1107 N. W. 14th Ave., has been appointed stocking distributor for Strait-line speed reducers and gearmotors made by the Industrial Products division of Western Gear Corp. The firm will also serve as the Northwest factory warehouse facility for Western Gear gearmotors, providing a new service to customers in that area.

The Portland firm, a distributor of major power transmission lines since 1949, serves industry in Oregon, southwest Washington, Idaho and western Montana. *Lester E. Andersen* is sales manager and *Bob Seymour* manages the office and warehouse, where some 2,000 equipment items are stocked.

Air Conditioning Supply Co. to Handle Metal-Aire Line

LOS ANGELES—Air Conditioning Supply Co., 137 S. Anderson has been named exclusive Southern California distributor for the All Aluminum Metal-Aire line of grilles and registers made by Metals Industries of Clearwater, Fla., and Metal Industries, Inc., of California, El Monte.

According to *Lind Davenport*, A. C. S. president, his 10-man staff is qualified to advise in proper grille and register selection, particularly at engineering and contractor levels. Extensive stocks will be maintained locally at both manufacturer and distributor sources.

Metal Industries, engaged in design and fabrication of aluminum products for the building trades, has a fully in-

tegrated plant for slitting, roll forming, blanking, assembling and refinishing.

A. C. S. also represents Drayer-Hanson and Pacific Steel Boiler, divisions of National U. S. Radiator Corp.; Connor Engineering Corp., New York Blower Co., Vaporizer Co., Inc., and Loren Cook Co.

Tile Roofing Plant Slated to Open in Walla Walla

WALLA WALLA, WASH. — March 1 has been set for start of production at a new manufacturing plant to be built here by Blue Mountain Ro-Tile Corp. The facility will manufacture tile roofing products from Ro-tile stone quarried in Idaho.

Initial plans for the company, which is affiliated with National Ro-Tile Corp., call for a local payroll of about \$100,000 annually.

Fred Amery heads the new firm, for which *Henry Butherus Jr.*, will be plant superintendent and *Tom Esary*, general manager.

\$20,000,000 Utah Smelter

HAYDEN, UTAH — A new \$20,000,000 smelter has been put into operation at the Ray Mines Division of Kennecott Copper Corp., here. The smelter and an adjacent new leach-precipitation-flotation facility will enable the company to recover oxide coppers from the Ray ore and the entire new production process will permit additional copper recovery from exceptionally low-grade ore.



**"THIS LUBRICANT
PRACTICALLY
ELIMINATED
BEARING
REPLACEMENTS"**

Says- C. O. SPARKS, INC.
& Mundo Engineering Co. of Los Angeles, Calif.

"Prior to using LUBRIPLATE, we were replacing shaker screen bearings within 60 to 120 days due to lack of or faulty lubrication. Since we started using LUBRIPLATE seven years ago, we have only replaced two shaker screen bearings and these because of natural wear. We now use LUBRIPLATE for general lubrication throughout our plant."

W. T. Ellington, President
Mundo Engineering Co.

**REGARDLESS OF THE SIZE AND
TYPE OF YOUR MACHINERY,
LUBRIPLATE GREASE AND
FLUID TYPE LUBRICANTS WILL
IMPROVE ITS OPERATION AND
REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



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FORMULA FOR REDUCED ASSEMBLY COSTS

Take a low-cost fastener like Milford Tubular Rivets. Feed and Clinch with precision Milford Riveters and you multiply the cost savings inherent in tubular rivets. See Milford for all sizes, styles and finishes of tubular rivets... See Milford for a complete riveter line. For the answers to assembly problems get in touch with Milford first!



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... for more details, circle No. 56

Sierra Steel to Sponsor Museum Exhibit in LA

LOS ANGELES—Sierra Drawn Steel Corp. will sponsor an exhibit concerned with manufacture and uses of cold finished steel bars, the first of its kind to be held in the California Museum of Science and Industry here.

The exhibit will be housed in the Museum's new Omnibus room and will feature a moving scale model, some three feet long, of a huge McKay draw bench in the firm's headquarters plant here. The model, designed and built in Sierra's shops, will simulate the pull of rough bars through the bench on the way to smooth, finished form.

A tape-recorded story of production methods, history and uses of cold finished steel and color illustrations that show how Western industry uses the product will be other features of the display. Visitors will be able to activate the model and recordings by lifting any of 12 conveniently placed earphones.

GPL Occupies Larger Quarters in Pasadena

PASADENA, CALIF. — General Precision Laboratory, Inc., has opened new Western quarters at 180 N. Video Ave., to meet expanding requirements for the firm's airborne and ground based electronic systems.

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Equipment Corp., the firm now has increased depot repair, field service and applications engineering facilities in an 8,000-sq. ft. structure. GPL is a leading developer and manufacturer of airborne navigation systems, data processing and display systems for air traffic control and a variety of other products.

Final Contract Awarded For Linde Liquid Gas Plant

PITTSBURG, CALIF.—A contract for the final construction phase of the Linde Company's multi-million dollar oxygen-nitrogen plant here has been awarded to Kaiser Engineers Division, Henry J. Kaiser Co., Oakland. This phase involves handling, placement, installation and testing of all major process equipment, piping and controls.

First section of the plant, which will be the biggest of its kind privately owned and operated in the West, is slated to start operations in June. Final completion is set for early 1960, when the plant's capacity will be 300 tons of liquid gases daily, serving nine Western states.

San Leandro Reports On 1958 Industrial Growth

SAN LEANDRO, CALIF.—Industrial expansions this year in this area totalled 50, representing an investment of \$17,560,000, which should create an estimated 1,113 jobs, according to the annual report issued by the San Leandro Chamber of Commerce.

This compares with last year's total investment of \$14,257,000 and 45 projects, which created 1,362 jobs.

This year's projects represented 31 new firms for the city and 19 expansions of existing plants.

Telecomputing Acquires Frank Cook Co. of Denver

LOS ANGELES—In its first major expansion eastward, Telecomputing Corporation, electronics firm, recently acquired the Frank R. Cook Co. of Denver, manufacturer of high-energy power sources for air and space borne applications. The Denver firm will become a division of Telecomputing, which is a principal manufacturer and subcontractor to industry and defense, comprised of eight divisions and two subsidiaries.

New address for the Cook firm is 3850 Olive St., Denver, where the telephone number is FL 5-3531.

Weightman Firm Moves

BURBANK, CALIF.—New address for Weightman & Associates, engineering and sales representatives for electronic component manufacturers, is 4029 Burbank Blvd., where the firm has larger quarters. The company's telephone number, Victoria 9-2435, remains the same. Weightman also has an office at 1436 El Camino Real, Suite 5, Menlo Park, and covers California, Arizona and Nevada.

Stran-Steel Appoints Wier Casady as Dealer

LOS ANGELES — Stran-Steel Corporation has announced the appointment of the recently established Wier Casady Steel Building Corp., as exclusive prefabricated steel building dealer for Los Angeles and Orange counties.

Casady will be assisted by Richard W. Dale, as construction superintendent and chief estimator. Dale has been associated with Casady for the past four years.

Wier Casady Steel Building Corp., will share offices with Wier Casady Co. at 5410 Venice Blvd., here. Telephone number is WEBster 8-2315.

Plastic Squeeze Bottles Now Made in California

LOS ANGELES—Western users of plastic squeeze bottles—a packaging medium gaining wide acceptance for varied uses—can now obtain them, for the first time, from a California manufacturer, Olympic Containers, Inc., 3471 S. La Cienega Blvd. After two years of pilot operations, Olympic now makes polyethylene bottles and containers with mass production equipment.

Affiliated with Olympic Plastic Co., the container firm has that manufacturer's facilities for injection, compression and a fiberglass molding and can offer a complete packaging service including caps, fitments and decorating.

Thermoid-H. K. Porter Merger Completed

PITTSBURG, PA.—Thermoid Co., Trenton, N. J. manufacturer of rubber, asbestos and tile products, is now part of the Thermoid Division of H. K. Porter Co., Inc., as a result of a merger completed in December.

Porter's new Thermoid Division will manufacture and market products formerly made by the Thermoid firm and the various works of Porter's Quaker Rubber Division.

Three top executives of Thermoid now serve on the parent company's board of directors, including Warren E. Hill, Thermoid president, now vice president and general manager of the new Porter division.

Product lines manufactured by Thermoid and by Quaker Rubber are complementary and the consolidation will provide the new division with a broader line, manufactured under both well-known brand names.

San Diego Firm Appointed To Handle Cannon Plugs

SAN DIEGO—Atlas Electronics, Inc. has been named as authorized industrial stocking distributor for plugs made by Cannon Electric Co., Los Angeles. Atlas recently moved into new quarters at 4618 Santa Fe St.

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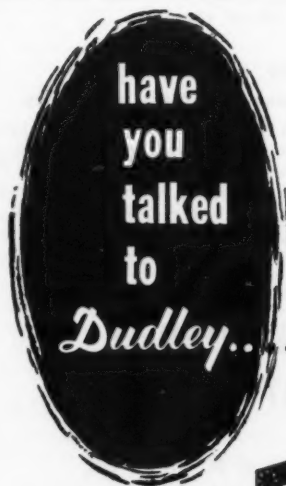
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WESTERN INDUSTRY — January 1959

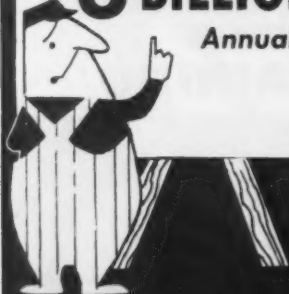
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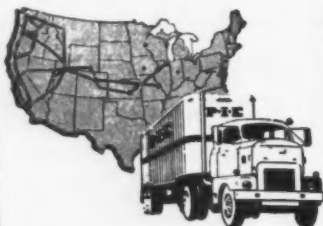
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Metals Men Check Show Site



LOOKING AHEAD TO March 16-20 when the 11th Western Metal Exposition will be held in Los Angeles, three executive officers of American Society for Metals, Cleveland, inspect Pan-Pacific Auditorium, site of the show. Display of new metal developments will also fill several special pavilions. On the scene, left to right, are **Ted Dumond**, ASM coordinator for technical sessions in the 11th Western Metal Congress; **Chester L. Wells**, exposition manager, and **Ray T. Bayless**, assistant secretary and temporary manager of ASM. (For complete run-down on program to be given at the Congress, see Western Meetings, page 14.)

16 Sacramento Plants Have 250 or More Employees

SACRAMENTO—Sixteen plants in Sacramento county employ 250 workers or more, according to a recent publication from the Sacramento City-County Chamber of Commerce. Products of these plants include aircraft propellants, missiles, freight cars, dairy products, detergents and various foods.

Among the companies with the largest work force are Aerojet-General Corp., Southern Pacific, Campbell Soup, Bercut-Richards Packing Co., and Libby, McNeill & Libby.

New Warehouse in LA for Eastman Kodak

LOS ANGELES — Pacific Southern sales division of Eastman Kodak Co. is building a new headquarters that will contain 130,000 sq. ft. of office and warehouse area and cost about \$1,750,000.

Composed of a single-story office building plus an adjoining 88,000-sq. ft. warehouse section, the facility will include special shipping facilities with provision for simultaneous rail and truck operations.

R. S. Hughes to Handle Permali Laminated Plastics

GLENDALE, CALIF.—R. S. Hughes Company, Inc., specialist in distribution of plastics to aircraft, electronics and other industries, has been appointed Western distributor for laminated plastics made by Permali, Inc., Mt. Pleasant, Pa.

Hughes will serve the 11 Western states, stocking Permali sheet, rod and bar stock in its warehouses at 1759

Victory Blvd. here, and at 564 College Ave., Palo Alto. Specialized parts machined to customer prints will be supplied direct from the Permali factory.

Permali combines high electrical insulation characteristics with exceptional structural strength.

K-W Distributing Co. Moves to New Quarters

LOS ANGELES—K-W Distributing Co., wholesale distributor of welding and safety supplies, has moved to 7332 S. Garfield Ave., Bell Gardens. A stocking distributor for Fibre-Metal Products Co., the firm was formerly at 2918 E. Florence Ave., Huntington Park, Calif.

WESTERNERS AT WORK...

Robert H. Braun Co.

... selects **Robert B. Conner** as sales engineer for the firm's conveyor division. Formerly in the material handling section of Food Machinery & Chemical Corp., Conner has extensive experience in industrial sales and engineering. The Braun firm recently became Southern California representative for Alvey Conveyor Manufacturing Co., and also handles other lines of material handling equipment.

Rust-Oleum Corp.

... appoints **David Webster** of Fresno, Calif., as an associate representative. In the industrial sales field for the last eight years, Webster will rep-

resent the firm in the territory from Bakersfield north to Sacramento. He will work with J. R. Boren, district representative, and Rust-Oleum distributors and architects in the area.

Bethlehem Pacific Coast Steel



W. J. Bolton

... promotes W. J. Bolton from the post of assistant general manager to that of general manager at its Seattle plant. He succeeds C. H. Beattie, who retired after being with the organization since 1916. Bolton joined the firm in 1948 and has also been assistant general manager in Los Angeles. Other personnel news at Bethlehem Pacific's Seattle steel plant concerns promotions of J. H. McKie to labor and transportation superintendent; T. J. Whiniham, roll shop superintendent, and J. P. Dana, superintendent of orders. All three have been either assistant superintendents or foremen in their departments for several years and replace three men who have retired. The retired department heads, whose service totals 127 years, are Ralph A. Eastwood, Henry A. Stepulis and M. J. Skube.

Denison Engineering Div., American Brake Shoe Co.

... appoints Duane E. Oyster to be manager of the Southwest regional office, providing the regional branch with services both as to engineering and sales and through its warehousing services at the regional office and warehouse, 3315 W. 12th St., Houston, Texas.

Pacific Gas & Electric Co.

... promotes Harold F. Carr to the post of manager of its East Bay Division, succeeding W. Frank Pape, who has retired. Carr has been with PG&E since 1930 and was most recently manager of the personnel department. Pape has completed 46 years with the firm, plus three years as a messenger boy during his school years.

Richards-Wilcox Mfg. Co.

... appoints Arthur H. Uhler as Western regional director, supervising sales and service branch offices in California, Nevada, Utah, Colorado, Arizona and New Mexico. Effective this month the regional director's office is in Los Angeles.

Gladding, McBean & Co.

... ups Addison Hawley to the position of general manager, pipe products division. He replaces R. C. Conover, who has resigned. An employee of the firm since 1946, Hawley in his new position will be responsible for all division operations including warehousing and marketing of vitrified clay pipe, conduit, flue lining, drain tile and related products.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are 1/8 inch short of contracted space to allow for borders and composition. Rates are \$15.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

General Chemical Division, Allied Chemical Corp.

... reports personnel changes involving district managers in the West. Harold Hansen, formerly manager of the Pacific Northwest office in Seattle, has been transferred to San Francisco to replace W. L. Hoefling, who has retired. W. E. Aust, formerly Denver district manager, will replace Hansen in Seattle. New Denver district manager will be H. E. Donaldson, previously assistant district manager in the firm's Los Angeles office.

Browne & Sharpe Mfg. Co.

... selects Colin Sharp as West Coast manager of its Cutting Tool Division. A veteran of some 25 years in the cutting tool field, Sharp will head up the sales organization in this territory, handling local arrangements for design, alteration and manufacture of cutting tools, plus providing sales and engineering assistance.

Reliance Steel & Aluminum Co., and Reliance Magnesium Co.



John R. Gibson

... announce that John R. Gibson has been appointed general sales manager of the two companies, which are headquartered in Los Angeles. Gibson joined the Reliance organization in 1947, and has recently been sales manager of the aluminum distributing firm.

Murray Manufacturing Corp.

... creates a new position, that of Western regional manager, naming Frank B. Murray to the post. Previously a sales engineer for Hoffman Electronics, Murray will have his office at 6115 Selma Ave., Los Angeles.

Bendix Industrial Controls Section, Bendix Aviation Corp.

... appoints Harry F. Isaman as Western field engineering representative, with offices at 5630 Arbor Vitae, Los Angeles. Isaman will provide engineering assistance to users of Bendix numerical control systems in California, New Mexico, Washington and Colorado. Isaman's background includes work with the Bendix computer division, Audio Products, Inc., and Litton Industries.

Linde Co., Division of Union Carbide Corp.

... names I. G. Kepner as Pacific Coast regional manager of distributor and apparatus sales, with headquarters in San Francisco. Kepner joined Linde in 1935 and has been Midwestern regional manager of apparatus sales since 1956.

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Aeromarine Plastics Corp.

... elects William C. Bentinck as vice president in charge of production for the Sausalito, Calif., firm. Formerly production manager, he has been with the company since its inception.

Huck Manufacturing Co.

... names M. W. Kostick as West Coast branch manager, replacing R. A. Villacres who is now Western division sales manager. Kostick, a Huck employee since 1956, will be in charge of the firm's Los Angeles warehouse and service facility in Inglewood.

American Potash & Chemical Corp.

... selects Dr. David R. Stern as manager of research at its Los Angeles plant. He succeeds Harold Mazza who is now plant manager of the Los Angeles facility. In 1951 Stern joined Western Electro-Chemical Co., which was acquired by AP&C in 1955. Recently he has been assistant manager at the parent company's Whittier, Calif. laboratory.

Silver Engineering Works, Inc.

... promotes Frank B. Price as chief engineer of the sugar equipment manufacturing firm. He has been with the company since 1947 and assistant chief engineer since 1953. In his new position he will be responsible for all engineering services and design work for the company's continuous sugar diffusers, beet pilers, dumps and field thinners.

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